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NEWS SUMMARY

GENERAL
Ecevit held over BBC interview
 Former Turkish Prime Minister Bülent Ecevit was detained again in Ankara only hours after a military court had ordered his release.
 The court had heard charges that Mr Ecevit, 56, had given an interview to a Norwegian newspaper in defiance of Government orders. He was accused of issuing false and exaggerated statements detrimental to Turkey's prestige and authority abroad.
 Mr Ecevit, the chief opponent of the military regime, is now being held in connection with an interview given to the BBC.
Steeltown aid
 The EEC is to allocate £30m, spread over five years, in an extra aid package for steel and shipbuilding areas of Britain.
Children die
 Four children—the eldest aged five—died in a fire at a maisonette in Lambeth, south London. Their mother, who had been at an all-night party, returned home at 8.30 am as firemen were putting out the blaze.
Teenagers shot
 Three Merseyside teenagers died in a mystery shooting tragedy in North Wales. The bodies of twins Mark and Michael Otter and a friend were found near their holiday caravan at Trawsfynydd, Gwynedd. Police believe no-one else was involved.
Yacht death
 The body of a woman who fell overboard from a yacht in a race off Harlepool was recovered by lifeboatmen. The search for a man from the yacht fleet continued.
Holiday arrests
 Ship windows were smashed in Scarborough, and fighting broke out over the weekend after gangs of youths attended a motor-scooter rally. More than 130 were arrested. In Southend, more than 80 arrests followed fighting between skinheads and mods.
Terror shooting
 Terrorists in speeding cars fired shotguns and hurled grenades at a police bus outside the converted courthouse in Rome where the alleged killers of former Italian premier Aldo Moro go on trial tomorrow. Three policemen were wounded.
Nuclear protest
 West Germany's anti-nuclear peace movement said 450,000 took part in Easter marches in protest against more U.S. missiles in Europe. Page 2.
 In Oxfordshire, protesters failed in an attempt to set up a peace camp outside the U.S. Air Force base at Upper Heyford.
Sleepless week
 A 55-year-old Frenchman is attempting to go without sleep for a week in a bid to win state aid for a printing company in Alençon which employs handicapped young people.
Briefly
 Ferry sank near Rangoon on Sunday. More than 70 were feared drowned.
 Galunggung volcano in Indonesia erupted on Sunday, six days after the last eruption.
 Kenya safari motor rally was won by Nairobi car dealer Sheikhar Mehta for the fourth successive year.
 Spanish Footballers' Association called off a pay strike by players through lack of support.

BUSINESS
Saudi oil output falls short of target
 SAUDI ARABIAN oil production last month averaged well below the 7m barrels a day output ceiling set at last month's Opec meeting and it is considering another 500,000 barrels a day cut to check the downward pressure on world prices. Syria has claimed to have shut off Iraq's pipeline to the Mediterranean. Back Page.
WALL STREET was 0.95 lower at \$41.99 shortly before the close. Page 23
CENTRAL ELECTRICITY Generating Board has told the Government it wants to increase substantially its coal imports this year, which could start a row with miners' unions. CEGB imports are presently held back to 750,000 tonnes a year. Page 6
INDUSTRIAL relations reform package proposed by BL Cars management has run into opposition from the company's two biggest unions. Back Page
A COMPROMISE over President Reagan's controversial proposals for the 1983 U.S. budget seems likelier in Washington. Back Page
UK TEXTILES and garments trade was in £1.04bn deficit last year with imports up 7 per cent and exports down 16 per cent by volume. Page 4
THE GOVERNMENT seems to be ignoring calls for tax concessions on petrochemical raw materials by BP Chemicals and others are growing of a plant closure at Grangemouth, Scotland. Page 1
AUSTRALIAN publisher Rupert Murdoch, owner of the New York Post, says he would be ready to buy the New York Daily News, but would propose nothing definite until Joe Albritton's option expired.
CHINA has agreed to pay \$5.5m (£3.13m) for photocopying machines and technology to Clark Copy International Corp., of Chicago. Page 4
BP CHEMICALS has doubts about the safeguards designed to protect its synthetic alcohol business written into the EEC wine agreement. Page 7
A RISE in Belgian interest rates helped the Belgian franc improve within the European Monetary System last week, although it remained the weakest member. The French franc showed little change, but market speculation about a possible realignment increased ahead of

Haig likely to return to Buenos Aires today : Parliament debate tomorrow

Argentine offer outlined to Thatcher Commons to hear progress report

BY JIMMY BURNS IN BUENOS AIRES AND DAVID TONGE IN LONDON

BRITAIN and Argentina yesterday showed first signs of edging back from confrontation over the Falkland Islands as talks between Mrs Margaret Thatcher, the Prime Minister, and Mr Alexander Haig, the U.S. Secretary of State, continued late into the evening.
 Mr Haig was reported to have discussed with Mrs Thatcher a firm offer by Argentina to withdraw its forces from the Falklands, provided Britain recognised Argentine sovereignty over the islands, ordered an end to its naval blockade of the Falklands and ordered its task force to return home.
 The British ban on Argentine vessels entering a 200-mile "maritime exclusion zone" around the Falklands came into effect at 0400 GMT yesterday. But, though the British Government had made it clear that any Argentine vessel found within this zone after the deadline risked being sunk, no incident had been reported by last night.
 The Defence Ministry in London said that there had been no reports of Argentine warships or naval auxiliary vessels within the zone since it was established. The Ministry confirmed that all but two of Argentina's major warships were still in port as they had been on Saturday. The Ministry would not comment on the whereabouts of the two remaining vessels, which are believed to be a corvette and, possibly, one of Argentina's two Type 42 British-built destroyers.
 The ministry, though it is now giving daily briefings, is still refusing to disclose any details on the location of the British naval task force or the rules of engagement which might apply to it.
 It is consistently refusing to



The Prime Minister with Mr Alexander Haig, U.S. Secretary of State, outside 10, Downing Street yesterday.

comment on reports that up to four British swiftsure class nuclear-powered submarines are in the Falkland Islands area to enforce the blockade.
 The U.S. Secretary of State is expected to fly back to Buenos Aires today with the British response to the Argentine troop withdrawal proposal, the existence of which was last night confirmed by the Argentine Foreign Ministry.
 Argentina has also accepted Peru's proposal to the two parties to the Falklands dispute to accept a 72-hour "cooling-off" period, which would allow Mr Haig's good offices mission to continue. The two-part proposal also involves the creation of a mixed peace-keeping force drawn from Latin American and other countries

UN security council resolution which demands that these steps should be carried out.
 The British Government has been insisting on an interim solution to diffuse the tension and has demanded that any question of sovereignty should be broached only at a later stage.
 However, in spite of these differences at 0600 yesterday some officials on the British side believed that a light had at last appeared at the end of the tunnel.
 Mr Haig telephoned Sr Nicenor Costa Mendez, the Argentine Foreign Minister apparently to stress the British view that sovereignty would only be discussed later on and last night the Argentine cabinet was meeting to talk over modifications to the proposals which they had made to Mr Haig, when he was in the Argentine capital.
 Among the ideas floated to help bridge the gap between the two sides is an Argentine suggestion that Argentine civilians should remain behind to administer the islands or share the administration with the Falklanders.
 However, perhaps even more crucial has been the problem of building a linkage between the two "phases" of the problem—the withdrawal of Argentine forces and Britain's willingness to discuss future arrangements for the islands. It is details of the linkage, however informal which may be established between these two phases which was at the heart of the long discussion between Mr Haig and Mrs Thatcher yesterday.
 To underline the strength of public feeling in Argentina over the Falklands issue, the authorities held on the biggest demonstration seen in Argentina in recent decades outside the Plaza Casa Rosada, the Presidential Palace while the talks were going on inside on Saturday between Mr Haig and General Leopoldo Galtieri, the Argentine President.
 In public, Argentine opinion presents a solid block behind General Galtieri in his refusal to cede either control or sovereignty over the islands. Backing for the Government's intransigent position, has come from the entire political spectrum including the Communist Party.
 Privately though, some Argentines are growing weary of the incessant propaganda they are being bombarded with on radio and television and are prepared to let foreign journalists they believe General Galtieri is simply trying to distract attention from Argentina's pressing economic problems.
 To counter its virtual

Firestone considers buying Hertz

BY RICHARD LAMBERTY IN NEW YORK
 FIRESTONE TIRE and Rubber, the second biggest U.S. tyre maker, is contemplating a bid for the Hertz car rental business, a subsidiary of the RCA Corporation. Firestone said that exploratory talks have already taken place with RCA, which announced in January that Hertz Corporation was for sale.
 Hertz, the U.S. market leader in car rentals, "is the kind of business and has the kind of management to which we would be attracted," Firestone said. But it warned that it was too early to say whether any offer would be forthcoming, and there have been reports that RCA is talking with other possible bidders.
 The asking price for Hertz has been put at about \$750m (£427.6m). The company has said that it expects that pre-tax profits this year will exceed \$100m. This would represent a very major diversification for Firestone which at the end of January had cash in its balance sheet of about \$330m.
 Firestone's net income in the first quarter of this year fell to just \$2m, compared with \$76m in the same period a year earlier. But the company said it was well placed to show significantly higher profits when the economy recovered.
 During the past few years it has substantially strengthened its position by closing surplus capacity and cutting its debt. At the end of last year, total debt represented 44 per cent of Firestone's equity, down from 72 per cent two years earlier.
 Tyres and related products account for more than four-fifths of Firestone's sales which totalled nearly \$4.4bn last year. Three-fifths of the tyre business is in North America.
 Mr John Nevin, who as chairman and chief executive has been responsible for reshaping the company in the last two years, has made it clear that Firestone wanted to reduce its exposure to the tyre industry. But until recently he has indicated that any major diversification was unlikely for another year or so.
 Earlier this year, the company agreed to sell a plant in Tennessee to Bridgestone Tire, the leading Japanese manufacturer, for more than \$50m. The plant makes radial tyres for use on heavy trucks and buses.
 Apart from the fact that Hertz is a major buyer of tyres, another possible reason for buying the car rental company is that Firestone has been developing a chain of automotive retail stores in the U.S.
 RCA's decision to sell Hertz followed a sharp fall in the group's overall profits and a steep rise in borrowings during 1981. Since Bendix announced last month that it had bought more than 5 per cent of RCA's shares there has been speculation that the whole company

to replace the estimated 10,000 Argentine troops on the islands.
 On the British side, Mrs Thatcher has been insisting that all she will discuss is withdrawal of Argentine forces and then the start of diplomatic negotiations over the future of the islands.
 The British line is that, at present, it is only prepared to talk about implementing the

Palestinians stage protest strike

BY PATRICK COCKBURN IN JERUSALEM
 PALESTINIAN'S in the Israeli-occupied West Bank and Gaza staged a near-total strike yesterday in protest at the shooting on Sunday at the sacred Temple Mount in Jerusalem. Two people were killed and seven were injured when a gunman in Israeli Army uniform opened fire on guards at the Moslem shrine.
 More than 90 people were reported injured in a series of clashes between demonstrators and Israeli security forces, which broke out yesterday.
 The latest violence erupted shortly before the White House in Washington announced that President Reagan was sending Mr Walter Stoessel, Deputy Secretary of State, to Israel for urgent talks.
 A White House spokesman said the visit was aimed to reduce tensions over Lebanon and reflected U.S. concern about a possible Israeli strike against Palestinian guerrilla positions in southern Lebanon.
 However, a State Department spokesman said later that Mr Stoessel's visit was aimed primarily at easing the remaining difficulties between Egypt and Israel before completion of the hand-over of Sinai to Egypt on April 25.
 Meanwhile, violent clashes were reported throughout the Israeli-occupied territories. The strike, which was called by the Supreme Moslem Council, appeared to have been more extensive than the one staged last month over the Israeli dismissal of three West Bank mayors.
 The old city of Jerusalem was completely closed yesterday and there were occasional clashes between stone-throwers and Israeli patrols.
 The Israeli Government is emphasising that the Temple Mount incident was the sole work of an unbalanced American immigrant, Alan Goodman, who was training in the Israeli army.
 Moslem leaders contend that their traditional religious rights on the Temple Mount are now under threat. This belief is intensifying sectarian animosities. The Moslem religious authorities have called for the immediate reopening to them of the mosque area.

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OVERSEAS NEWS

French Socialists row over delayed Bill

BY DAVID WHITE IN PARIS

THE French Government's efforts to refurbish its public image in time for next year's key municipal elections have been given an embarrassing setback at the start by a clash with its own Socialist Party supporters in the National Assembly.

Friction arose over the postponement of a new penal bill, designed to replace a controversial reform introduced in the last days of the Giscard Administration. Party members were evidently not consulted about the change of agenda.

Socialist deputies showed surprise and anger last week over the delay in bringing out the new provisions, which were to have been approved at Wednesday's Cabinet meeting.

M Pierre Mauroy, the Prime Minister, said that the Government would keep its word and repeal the Security and Liberty Act — generally known as the Peyrefitte Law — but that security problems required a "global" approach. He added that a new text would be tabled during the current parliamentary session, ie before the

Unions prepare riposte to Renault

FRENCH unions were last night preparing a riposte to the Renault car group after its decision to lay off almost 7,000 workers at its Flins factory, west of Paris, as a result of a pay strike, our Paris staff reports.

The dispute, which, after a prolonged conflict last autumn, brings the state-owned motor company back to the forefront of the labour scene, overshadows a series of talks which M Pierre Mauroy, the Prime Minister, is to have

with the main union federations during the week.

Both the Communist-oriented CGT and its left-wing rival, the CFDT, called on all the plant's 18,000 workers to turn up when the gates re-open today after the Easter break.

The lay-offs were prompted by the outbreak of a fresh strike movement immediately following the settlement of a first, week-long pay dispute last week.

The new strike involves

250-300 workers according to the company, or 1,200 according to the unions.

The dispute involves mainly immigrant assembly-line workers engaged on the Renault-5 and Renault-15 models.

The CGT has attacked the lay-offs as "worthy of the Giscard Government." M Jean-Louis Fournier, a CGT chief at the company's main Paris plant, said that Renault workers' situation had worsened since President Mitterrand's election last year.

Its clauses included tougher sentences, reinforced powers to carry out identity checks, police custody of up to three days in certain cases instead of two, and — as part of an effort to speed up criminal procedures — wider powers for public prosecutors to bring suspects straight to court without

maintaining the Peyrefitte Law, even temporarily, would do nothing to curb violence and that the authorities should not be influenced.

M Robert Badinter, the Justice Minister, said that the postponement was "not an event," and that the new text should be put before the Cabinet by the end of this month.

The decision was taken against a background of evidence that concern about security may have played a role in the Government's recent loss of popularity and its defeat in last month's cantonal elections. This concern has come to the fore with recent incidents such as the explosion which killed five passengers on the Paris-Toulouse express on March 29.

Latest polls show that President Mitterrand and M Mauroy, while keeping a majority in their favour, lost sharply in popularity between late February and late March, and that M Gaston Defferre, the Interior Minister who has been at the centre of a row with his top police hierarchy, plummeted 16 points to show a



M Pierre Mauroy: trying to halt popularity slide

Japanese unions likely to accept moderate rises

BY RICHARD C. HANSON IN TOKYO

JAPANESE unions are expected to accept moderate pay rises in the next few days as this year's wage battle comes to a head.

Public and private transportation were saved from striking today when union leaders of major private and public railway and bus companies agreed to wage increases worth just over 7.06 per cent last night.

This year's settlements will depend largely on the outcome of negotiations by members of the powerful Council of Metalworkers' Unions — which include motor, steel, shipbuilding, and other metals and electrical machinery unions.

The unions have tabled an initial demand for a 9 per cent increase in basic pay. Management, on the other hand, is offering rises of slightly over 7 per cent.

As indicated by last night's agreement, settlements are generally expected to be reached near the latter figure. Unions' demands for higher increases have been undercut by a slowing in the economy and,

ironically, by lower rates of inflation this year.

Last year the unions were able to secure an increase averaging 7.7 per cent. But this was still less than the rate of inflation, resulting in decline in real wages of about 0.1 per cent.

Inflation this year, according to official projections, is running at about 4 per cent — versus 7.8 per cent.

The final settlement will almost certainly leave the average worker in a large company with a real increase of about 3 per cent. Workers in smaller companies, however, which have been harder hit by the economic slump, will be hard-pressed to keep pace.

Concessions by management so far have been, to say the least, moderate. The electrical workers' union, for example, was forced to struggle hard to win just one more day per year.

Japanese companies have argued strongly for modest settlements, citing the concessions being made by unions in the U.S. and West Germany this year.

AFTERMATH OF ATTACK ON DOME OF THE ROCK

Pilgrims desert Jerusalem as patrols move in

BY PATRICK COCKBURN IN JERUSALEM

THE NARROW, winding streets of the old city of Jerusalem, normally packed with pilgrims celebrating Easter and Passover, were empty yesterday, apart from the occasional Israeli patrol and the odd stone-thrower.

The Temple Mount area, above whose walls can be seen the silver and gold dome of the Al-Aksa mosque and the 1,200-year-old Dome of the Rock, was cordoned off by Israeli troops.

Workers are trying to replace the glass broken by bullets on Sunday when Alan Goodman, a Jewish-American immigrant doing his basic training in the

Israeli Army, sprayed the interior of the Dome of the Rock mosque with two magazines from his M-16 sub-machine gun.

Even the Holy Sepulchre Church, site of the crucifixion, where normally a dozen different Christian sects can be found, was largely empty. Occasional bursts of gunfire could be heard across the roofs of the city, as Israeli patrols fired into the air to disperse demonstrators.

All the hundreds of little shops, selling everything from groceries to some of the world's most repulsive tourist knick-knacks, were closed. Occasion-

ally, Arab women, wearing long embroidered dresses, darted out to buy bread from a few carts beside the city gates.

The only sign of the tens of thousands of tourists and pilgrims, who have poured into Jerusalem over the last week, was a party of Germans dourly picking its way over stones buried at Israeli troops, apparently not heeding the sporadic violence around them.

The strength of the reaction in Jerusalem to Sunday's shooting is significant because the city is normally slow to

recourse to an examining magistrate.

While opposition deputies crowded over the Government's "total incoherence," M Raymond Forni, Socialist chairman of the National Assembly's Law Commission, attacked the "clumsy decision" to postpone repeal. He said that

Mecca and Medina, just as the Walling Wall on the Western flank of the 36-acre Temple Mount area is sacred to the Jews.

Over the past few years, there have been an increasing number of clashes over the right of Jews to worship on the Temple mount itself.

For the moment, the Israeli Government seems keen to keep a relatively low profile, and there has not yet been any attempt forcibly to reopen shops on strike. This could provoke further violence.

Polish recovery possible

WASHINGTON — Poland's industrial capacity remains large and, if economic reforms and labour peace could be achieved, a study for the Joint Congressional Economic Committee said.

Meanwhile, however, the imposition of martial law in Poland has compounded existing economic problems, according to the report.

While Poland's policy during the 1970s of heavy industrial investment financed by hard currency borrowings has left it with massive foreign debts, it has also left it with a basis to rebuild its shattered economy," the report said.

The report said obtaining hard currency to buy Western goods will be the main difficulty in Poland's trade with the U.S. and other Western countries.

"Solidarity's political crisis which emerged in 1980 and 1981 was a result, not a cause, of Poland's economic problems," said Mr Henry Reuss, the committee chairman.

Poland imported large amounts of goods and equipment in the past decade to expand its industrial capacity and raise its standard of living, and paid for that growth with credit from Western governments and banks, the study said.

The Polish Government gambled that growth of exports would enable it to repay the debt to western banks, but it was unexpectedly hindered by the western recession.

After 1975, Poland was also hurt by mismanagement and bottlenecks in its opening of new factories.

Radio Solidarity, a new organisation apparently formed recently was planning to broadcast its first programme last night although some technicians doubted its chances of success.

Agencies.

Zimbabwe policeman killed in beer hall attack

BULAWAYO — A Zimbabwean police officer was killed and three other were wounded in a weekend grenade attack on a patrol in Bulawayo, the country's second city, officials disclosed yesterday.

At least two civilians were also wounded in the blast which occurred in a suburban beer hall on Friday night. Several people have been arrested in connection with the incident.

Five policemen went to the beer hall after a report of trouble there, and the grenade was tossed in when they entered, a police spokesman said. There was no indication of the motive behind the attack, but dissident

remnants of former guerrilla groups are in the area.

Mr Emmerson Munanganga, head of state security, said recently that a number of people, including former guerrillas loyal to Mr Joshua Nkomo, had been arrested in Matabeleland province following the discovery of secret military training camps.

Mr Nkomo's followers were disappointed by their leader's defeat by Mr Robert Mugabe in Zimbabwe's independence election two years ago and it is thought some may have taken to the hush rather than accept the fact.

Reuter

German N-protesters say 450,000 backed rallies

DORTMUND — West Germany's anti-nuclear movement said yesterday that 450,000 people took part in Easter marches to protest against the planned deployment of new nuclear missiles in Europe.

Four days of peace rallies ended last night with demonstrations in Dortmund, West Berlin, Hanover and other cities which, the organisers said, drew about 120,000 protesters.

The weekend turnout, despite poor weather which included snow, was hailed as a major political success by a spokesman for the peace movement in Frankfurt, where the nationwide campaign was co-ordinated. "The message is that we shall not rest until the deployment of medium-range missiles is stopped," he said.

The organisers' attendance figures were challenged by

police spokesmen in Dortmund, where yesterday's largest rally was held, and in Frankfurt, where the peace movement claimed 60,000 participants in a rally on Sunday.

Frankfurt police said 20,000 attended the rally, while organisers estimates of between 50,000 and 70,000 for the Dortmund protest were at least three times the figure issued by police. The demonstrators in Dortmund, a rallying point for marchers from the industrial Ruhr, were led by a former mayor of West Berlin, Herr Heinrich Albers, that the peace movement was also gaining strength in the U.S.

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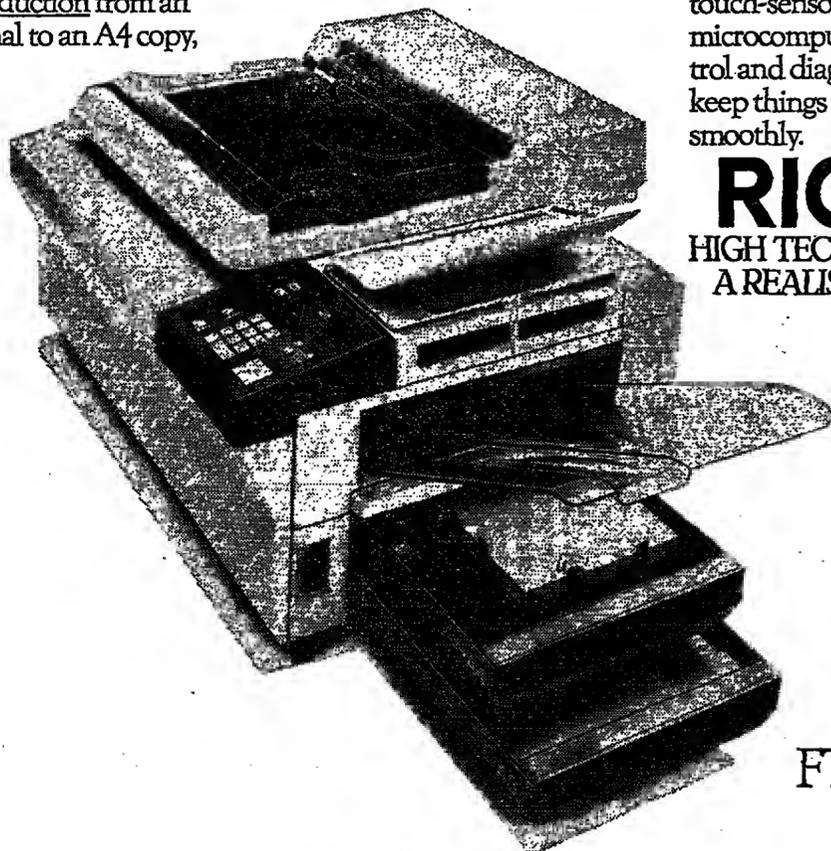
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THE FALKLAND ISLANDS INVASION

Japanese hint at economic sanctions

By Charles Smith, Far East Editor, in Tokyo

JAPAN yesterday warned Argentina that the two countries' economic relations "might be disturbed" if the crisis over the Falklands is prolonged.

It also called for the early withdrawal of Argentine troops from the Falklands and urged the government in Buenos Aires to go along with American "good offices". The Japanese warning, which was conveyed to the Argentine Ambassador by Mr Yoshio Sakurachi, the Foreign Minister, represents Japan's response to a British call for sanctions against Argentina. Roughly the same form of words as that used to the Ambassador is understood to have been included in a letter sent yesterday to Mr Zenko Suzuki, the Japanese Prime Minister, in reply to Mrs Thatcher's letter of last week.

Japanese officials were at pains yesterday to emphasise that the Government had responded "positively" to British demands for sanctions, and had not rejected them as earlier reported. Though officials were unable to say how soon relations with Argentina "might be disturbed" if the current situation continues, or in what way the Japanese news agency Kyodo said Mr Suzuki had refused to impose economic sanctions against Argentina.

In her letter last week Mrs Thatcher asked Japan to ban all imports from Argentina and to use "self-restraint" in the extension of commercial credit. The letter also asked Japan not to export arms but this is in any case banned under a Japanese Government code.

Japan was quick to condemn Argentina's use of force in the Falklands, through its UN ambassador, but has hinted that it might also condemn the use of force by Britain. The Japanese position on the Falklands crisis is not related to the substance of the issues pending between the Argentine and the UK. In other words, the Government keeps an open mind on the question, which side the islands actually belong to.

Japan exports to Argentina in the first 11 months of 1981 were worth \$749m, or about 0.5 per cent of its total exports, while imports came to \$260m (0.2 per cent of the total). These figures rank Argentina well below Brazil and Mexico in the list of Japan's Latin American trading partners. However, a series of recently secured plant contracts could make the relationship more important in future. The contracts include a \$776m rail electrification project won by Marubeni and Toshiba together with a share in the \$200m Yacireta power project (in which West Germany is also involved).

Jimmy Burns in Buenos Aires surveys the islands in the eye of the storm Falklanders resist Argentine blandishments

IT IS DIFFICULT to believe that the island fortress at the centre of a major international crisis was once a sleepy island community—a picture-postcard image of English village life complete with its bobbies, town hall and pubs.

But there is no over-estimating the transformation that has taken place in the Falkland Islands since the Argentine invasion 11 days ago.

With the deadline of the blockade falling due, the Argentine armed forces yesterday announced that they had completed the bulk of an operation they considered necessary to defend the islands from a British attack.

For over a week military transport planes have been shuttling troops and equipment around the clock to the islands from the southern mainland bases of Comodoro Rivadavia and Rio Gallegos. So massive has the traffic to the islands been that the authorities have had to call up civilians who had completed national service to back up the professional reinforcements.

Ambitious craft and naval personnel that were used in the invasion have been reinforced by an impressive array of armaments and troops. Although exact details are censored by the military authorities, the build-up of the past few days is known to have included the transport of armoured personnel carriers, sophisticated radar equipment and long-range guns and anti-aircraft guns.

The long-range guns have been placed in coastal positions on the islands and will presumably be used against the British fleet, if and when it enters the area. Meanwhile, fighter planes now straddle Port Stanley's only runway in preparation for any air attack.

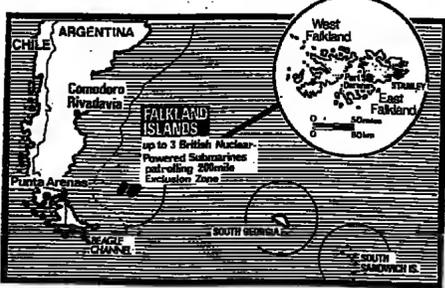
There are over 10,000 troops on the islands, compared to an estimated 4,000 at the time of the invasion. The build-up followed the inauguration of the military governorship of General Mario Benjamin Menendez, a man of few words but tough military tactics and a strong contrast with his predecessor, Mr Rex Hunt, the general British colonial officer, whose principal activities used to be squash and kitchen gardening.

While festive pro-Government demonstrations take place among the Argentines and cold back-room diplomatic negotiations continue, it is perhaps easy to forget the human drama being lived by the islanders themselves. Foreign journalists have been banned from travelling to the islands since the invasion took place. But it is possible to read between the lines of Government statements, scattered eye-witness confessions, and the comments of the few Argentine journalists who have managed to report from the occupied Falklands a picture of what life must be like.

General Menendez said over the weekend that the islanders remained "distrustful" of Argentine troops, but that is understating the fears of the 1,800 islanders. "The military build-up is now so great that any attack by British troops would provoke a bloodbath, in which many islanders would be killed," said Sr Jorge Bardot, a Spanish businessman, who was recently evacuated from the islands.

So great are the fears of the local population that the head of the Anglican Church in Argentina, has offered to contribute to "their serenity." He said over the weekend that he would be accompanied by members of the Anglo-Argentine community, who would make an effort to impress upon the islanders the good relations that have always existed between Britons and Argentines living on the mainland.

The hearts-and-minds campaign has, so far been spearheaded by the military authorities. Although they imposed severe restrictions on the movement of civilians immediately



after the invasion, these have now been lifted and significantly there is now no state of siege as has been enforced on the mainland since 1975.

Before the invasion, newspapers in the Falklands used to carry regular reports about human rights violations in Buenos Aires. Clearly, though, the military authorities have maintained their tight-glove approach to the inhabitants in view of possible future moves at the negotiating table.

Equally subtly, the Argentines have moved to consolidate their hold on the islands by linking up the local radio with the mainland and introducing an Argentine-speaking television network. Islanders are reported to have been offered free television sets by the authorities and have been told that they can look forward to seeing Argentine coverage of World Cup football in June.

The national news agency, Telam, has set up offices in Port Stanley and now provides the only regular flow of news from the islands, since other Argentine journalists have had their visits restricted. Argentine teachers have

arrived on the islands to replace English women who, before the invasion, used to travel to the more remote areas to supervise lessons with the families of sheep farmers.

The Argentines have also sent food and supplies to the islands during the past few days, as a precaution against the British blockade, and the Argentine peso has replaced the pound in commercial transactions. At least one Argentine bank, the Banco de la Nacion, is preparing to set up offices in Port Stanley.

Despite their efforts, the military authorities are facing a daunting task in their attempt to seduce a people whose British values are deeply entrenched and who are reported to regard the fact of the invasion as a challenge to their right to self-determination.

Argentine journalists, who were briefly allowed on the islands a few days after the invasion, were genuinely surprised to discover the cultural divide and that the kelpers still resented what Buenos Aires had presented as a "liberation."

One defiant interviewee told a huffed Argentine journalist that his name was Mickey Mouse and that the only thing he wanted to know was how soon the Argentine troops were going to get out.

In a more sombre mood, the local Roman Catholic bishop said that it was difficult to accept such a massive military presence, when the islanders had lived perfectly well for over a hundred years with little crime and less than four policemen.

Behind the islanders' defiance remains their one surviving link with Britain—the World Service of the BBC, which broadcasts daily messages of support from British officials and uncensored reports about the hectic diplomatic manoeuvring.

EEC trade ban will follow talks in Brussels

BY GILES MERRITT IN BRUSSELS

THE EEC trade ban against Argentina, secured by Britain from its Community partners in a tough diplomatic tour de force over Easter, is expected to be implemented immediately following a brief round of technical talks in Brussels tomorrow.

The permanent representatives to the EEC of the 18 member states are due to meet then to put the finishing touches to the economic sanctions against Argentina that Britain obtained in a Brussels diplomatic demerit of unprecedented speed.

The main purpose of the ambassadors' further meeting is to synchronise the national measures that the Community countries have agreed to take under Article 224 of the Treaty of Rome.

The intensive consultations of April 9-10 in Brussels settled on that device, rather than on the more procedural blanket measures of Article 113 that ran into opposition from Denmark, and it is, therefore, necessary that the member states' own trade embargoes should be scrutinised to ensure that they dovetail effectively.

The permanent representatives are also expected to review the status of the European Commission's proposal of last week that Argentinean products should be denied preferential access to the EEC under the Generalised System of Preferences. But it is anticipated that such a move will now be dropped as being redundant following the total trade ban.

The rapidity with which the UK's Community partners

agreed to freeze all EEC-Argentinean trade—worth some \$3.5bn (£1.9bn) a year—has been in marked contrast to the confused and dilatory fashion in which previous trade sanctions demands, mutually against the Soviet Union following the Afghanistan and Polish crises, have been treated.

It is thought that Britain will shortly attempt to harness this new political solidarity with further diplomatic initiatives against Argentina.

Reuters adds from Buenos Aires: Argentina has condemned the EEC ban on its imports over the Falklands dispute as an act of grave hostility, and has announced that imports from EEC countries will be subject to government approval on a case-by-case basis.

The EEC ban will strike a harsh blow at the Argentine economy, closing a market which has absorbed about one quarter of the country's exports. Most of Argentina's exports to the EEC consist of agricultural products, particularly meat and oilseed derivatives.

The EEC bought \$1,676m worth of Argentine goods in 1980, out of Argentina's total exports of \$7,266m in that year.

'Truth squad' to put Galtieri's case abroad

A GROUP of Argentine politicians has formed a "truth squad" that will visit the U.S. and other countries to explain the position of General Leopoldo Galtieri's government in its conflict with Great Britain over the Falklands.

The politicians, representing several parties, told the private Argentine news agency Noticias Argentinas on Sunday that they would talk with "influential friends" and political "organisations" in several countries.

Antonio Cafero, Economics Minister under former President Sra Isabel Peron, was due to travel to the U.S. yesterday to seek meetings with Senators Howard Baker and Edward Kennedy, the politicians said.

Sr Francisco Cerro, the Christian Democratic Federation leader, and Progressive Democrat Sr Rafael Martinez Raymonda are set to visit Italy and Spain, and Sr Italo Luder, a Peronist and former Senate President, is to travel to the U.S. and Spain.

Brazil is sending a naval squadron on manoeuvres near its southern border in the next few days, but the move is not connected with the Falklands crisis, Navy Minister Sr Maximiano Fonseca has said.

He told reporters at the weekend that ships would leave Brazil's main naval port in Rio de Janeiro for the waters off Rio Grande do Sul state, which borders Uruguay. Agencies

Spy ship drops back

A SOVIET ship continued to track the Canberra yesterday as it sailed towards the Falklands.

A frigate-sized Soviet intelligence vessel dropped back over the horizon during the night, denying the 2,000 British troops on the Canberra a view of it.

It is now believed to be about 12 miles astern.

British officers think the Russians cannot fail to have been impressed by the speed with which the 45,000-ton luxury cruise liner, chartered by the Navy last Monday, was sent to sea as a troop ship from Southampton in four days.

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WORLD TRADE NEWS

Decline in exports hurts Britain's trade in textiles

BY ANTHONY MORETON, TEXTILES CORRESPONDENT

BRITAIN'S trade balance in textiles and garments slipped badly last year. Imports are estimated to have risen by 7 per cent by volume while exports dropped by 16 per cent. The figures show that British trade with the Common Market is growing. The amount of goods coming from the 10 EEC countries rose by 26 per cent compared with a rise of only 3 per cent in those originating in low-cost Third-World countries.

According to the British Textile Confederation the UK had an adverse balance of trade during the year of £1,042m, of which clothing accounted for £580m.

These figures, as the BTC points out, have to be treated with some caution. Because of the long strike by civil servants last year there are still no official figures for imports covering the five months from April to August, and for exports from March to August. The Confederation has produced its 1981 totals by grossing-up, or annualising, the totals available.

It will probably be the middle of this year before the backlog of figures for 1981 is published. When the definitive totals become available, however, they are unlikely to be radically different from those now produced by the BTC. The rise in imports last year followed a fall in 1980. What is particularly disturbing is that while there was a 7 per cent rise over the whole year, the

growth in the last quarter was 15 per cent. This one quarter accounted for half the year's increase.

The reverse experience seems to have occurred in export markets. Although there was a big fall in exports—16 per cent—over the year the final quarter saw just a 1 per cent drop. Clothing exports managed to hold their own much better than textiles and only ended the year slightly worse than in 1980.

The figures starkly hide some trends which will become more apparent in future years as the consequences of the recession and cut-back in the domestic industry come to the fore.

Man-made fibres

The major part of the increase in imports from the EEC was in two areas—man-made fibres and carpets. The former was due in great measure to the reduction in UK capacity over the past two years and is unlikely to improve when the economy picks up. Britain is now much more dependent on overseas suppliers for its fibres than it was in the late 1970s.

The report also draws attention to the high level of imports of certain goods from certain countries, especially cotton yarn from Turkey and knitted underwear and dresses from South Korea.

The fall in exports was also due to a considerable extent to the fall in UK productive capacity.

David Marsh analyses Britain's traditionally strong 'invisibles' export sector Profits overseas boost current account

ALMOST unnoticed amid the publicity surrounding announcement of Britain's record £8bn current account surplus last year, the Government has published figures showing significant shifts of importance among the country's invisibles exports.

The surpluses habitually chalked up by the financial sector—banking, insurance, commodity trading, and so on—remain buoyant. But the City's place as Britain's top exporter of services has come under serious challenge from consultancy and construction companies winning an increasingly important share of the world's "invisibles" market.

Britain's balance of payments has always been characterised by deficits in visible trade and surpluses in invisibles. Since 1916 there have been only seven annual visible surpluses and two deficits in invisibles.

The normal pattern was distorted last year. A combination of buoyant exports, self-sufficiency in oil and a recession-induced slump in imports pushed the visible surplus to a record figure probably of close to £5bn. (The exact figure is not yet available because of the effects on data collection of last year's Civil Service dispute.)

The surplus on invisibles, at around £3.3bn, also seems likely to have been one of the largest ever registered. The improvement was due mainly to one of the three components of the invisibles account—interest, profits and dividends, which were boosted partly by higher earnings on Britain's stock of overseas investments built up after the ending of exchange controls.

Of the other two components, the contribution from both the services sector and from transfers (both Government and private) were little changed.

Within the services account—which is where Britain's invisible exporters jostle for positions—there have, however, been important developments.

The travel industry as a whole no longer figures as a net earner of foreign exchange. For the first time since 1967, Britain had an overall deficit

BRITAIN'S 'INVISIBLES' BALANCE OF PAYMENTS PRIVATE SECTOR SERVICES (Net figures, £m)

	1970	1975	1977	1980	1981
Sea transport	-80	+33	+121	+135	+112
Civil aviation	+46	+105	+288	+395	+437
Travel	+50	+301	+698	+208	-245
Financial	+439	+1,025	+1,584	+1,355	+1,799
Other	+335	+575	+2,073	+2,587	+2,767

Source: Central Statistical Office, Bank of England

on the travel account, in 1981. Financial services showed an increase in earnings of around 16 per cent, somewhat ahead of inflation. But at £1.6bn, financial earnings are now only about two-thirds of the overall surplus from "other" services, where consultancy earnings in particular have been holding up well.

"Other" services comprise a myriad of often obscure sources of overseas invisibles earnings whose growing importance is often overlooked. Altogether, this sector contributed £2.8bn to the balance of payments last year, after £2.6bn in 1980.

Apart from overseas construction and consultancy earnings, this sector also includes receipts from overseas students and journalists (which has been increasing as a result of higher British student fees, and spending in the UK by foreign governments).

The sectoral breakdown for 1980—full 1981 figures are not yet available—show Britain's overseas earnings from construction and consultancy together with research and development, at £1.2bn, were only slightly less than total earnings from financial services, which came to £1.6bn that year.

The Association of Consulting Engineers, which represents the 120 major engineering consultancies engaged in work

abroad, reports that its members' overseas fees last year rose to close to £490m from £425m in 1980 and £401m in 1979.

Association members are working on international engineering projects with a total capital value of £46bn. The Association says that consultants have benefited from British designers' high reputation, particularly among oil exporters and other big capital spenders in the developing world.

The oil states may provide a less rich source of income now that many Opec members are suffering a spending squeeze. But engineering consultants point out that there are still a lot of other countries to go round. British consultancy expertise was on show at a three-day conference in Bombay earlier this month, organised by the Commerce on Invisible Exports to woo contracts from Indian business. UK consultancy earnings stand to benefit from the £380m package of orders for the Singraul power station and coal mine now under negotiation.

China and U.S. sign photocopy agreement

By Tony Walker in Peking

China has agreed to pay \$5.5m to a small American company for the supply of photocopying machines and technology in a further sign of its return to normal business with the West.

Agreement was signed at the week end by Clark Copy International Corporation and the China Import and Export Corporation for the shipment of 1,000 photocopying machines by the U.S. company and components for another 3,000 to be assembled at a factory in Guilin, south China.

Under phase two of the agreement, the U.S. company will assist the Chinese to manufacture the machines at the rate of 200,000 a year for domestic use and export.

Clark Copy International, a small Chicago-based company, beat off challenges from big rivals like Xerox and IBM for the Chinese contract which will run for 20 years.

Mr Otto A. Clark, head of the corporation, said in Peking that his machine was cheaper and more compact than models produced by competitors.

The American company is expecting to receive some \$60m payment over 3-5 years for components it supplies to China for the copying machines.

Ricoh reaches marketing deal

RICOH, the largest Japanese producer of photocopiers, has surprisingly renewed its European marketing agreement with the U.S. company Nashua after a two-year split. The new agreement, which runs to 1990, is claimed to be worth £100m.

Ricoh claims to produce more copiers than any other company in the world, although by value Xerox sales are considerably higher. Until recently Ricoh products were sold in Europe by both Nashua and Kalle Infotech, a subsidiary of the German chemicals company Hoechst. Two years ago Ricoh announced it would enter both markets directly and would not renew its contract with Nashua, which ran out in 1983. Faced with the prospect of losing its product Nashua tried to manufacture copiers itself and failed, the U.S. production line was closed about six weeks ago.

BSC wins £10m export order from Kaiser Steel

BY ROBIN REEVES, WELSH CORRESPONDENT

THE BRITISH STEEL CORPORATION'S strip products group has won a £10m export order to supply the U.S. Kaiser Steel Corporation with 75,000 tonnes of steel slabs, for delivery by the end of the year.

The contract, which could be the first of a series to be loaded at the BSC's Port Talbot works, South Wales where Kaiser's requirements, according to BSC, complement Port Talbot's product range exactly.

Mr Peter Allen, a managing director operations, attributed the order to the improvement in Port Talbot's cost competitiveness, following BSC's "slimline" redundancies two years ago.

KCA Minerals has won a \$13.5m (£7.5m) one-year contract to provide Pemex, Mexico's state oil company, with 115,000 tonnes of powered

barite—a key element in drilling fluids. The barite is being supplied from China where KCA has just completed a new barite mill at Wuzhou in Guangxi Zhuang province in south-west China, bulk for the Chinese as part of a 10-year trading agreement with the China National Metals and Minerals Import/Export Corporation (Minmet).

Redifusion Radio Systems has won a £2.3m contract to supply communications systems to the Government of Ghana for the supply of civil aviation communications systems. The initial order, which was won in competitive tender, has since been extended.

The principal part of the order covers the supply of a comprehensive system for the flight information centre at Kotoka Airport in Accra.

Saudi financing for Italian project

MILAN—Franco Tosi, the mechanical and electric unit of the Pesenti group, has obtained a loan of SR 90m to finance the building of turbines for a thermoelectric plant at Al Jubail in Saudi Arabia, connected to a seawater desalination plant.

The loan is in two tranches, each repayable in two years. The first of SR 30m, will carry a fixed interest rate slightly below the Bahrain interbank rate for the first year and a variable interest rate for the second year. The SR 60m second tranche will carry a variable interest linked to the three-month London interbank rate.

Shipping report

Poor outlook on productivity of bulk fleet

By Our Shipping Correspondent

THE CRISIS in the Falkland Islands left shipping markets relatively unperturbed last week, but the overall state of the industry continues to cause concern. "The future looks bleak indeed," said R. S. Pleatou, a leading Norwegian firm of shipbrokers, basing his pessimism on the amount of dry cargo tonnage shortly coming into operation.

In its comprehensive annual shipping review, Pleatou said: "We feel justified in asking whether the time has not now come to consider cancellation, or at least postponement of delivery, of the latest deliveries of bulk carriers on order."

New ships scheduled for delivery this year represent around 9 per cent of the present bulk carrier fleet. The growth in combined oil and bulk carriers is expected to be slower, however, causing a rise of nearly 8 per cent in the total tonnage on the bulk markets.

The biggest expansion is expected in the Panamax fleet, comprising vessels of 60-80,000 deadweight tonnes which are the largest that can go through the Panama Canal. This sector should move up by more than 14 per cent in 1982, Pleatou calculated.

But transport requirements are unlikely to rise by anything like enough to use up all the available capacity, based on the likely state of the world economy. "This leaves us in considerable doubt as to the future productivity of the bulk fleet."

The situation would be changed by a congestion of tonnage such as that seen in Hampton Roads on the U.S. east coast early in 1981 when ships were queuing up to take on coal. But Pleatou thought such a development looked unlikely.

It concluded that the most important factor affecting international shipping this year would be the state of the world economy.

Mexico inaugurates its first Pacific oil port

The Mexican Government has officially inaugurated its first oil export port on the Pacific Coast at Salina Cruz, William Chislett writes from Mexico City.

The port, built at a cost of \$108.8m, has storage capacity for 2.5m barrels and can take tankers up to 250,000 dwt. Mexico has two other ports for oil exports, both in the Gulf. The new port will be mainly used for oil shipments to Japan which is viewed as a potentially major customer for Mexico in the long term. At the moment Japan has contracted exports from Mexico for 140,000 b/d.

Oil is pumped over the Isthmus of Tehuantepec to Salina Cruz from Mexico's major onshore and offshore fields.

UN guidelines on flags of convenience

GENEVA—The UN begins drawing up guidelines this week to limit flags of convenience, the foreign-registering of ships which critics say disregards safety and labour laws and burdens Third World shipping industries.

The 17-day meeting opening today will seek agreements on ship manning, management, financing and identification as part of a future international pact to ban what is known in the trade as open registry shipping. It comes at a time of slump for the shipping industry—about one third of the world's super-tankers are idle—and when industrial states profiting from the freighters and tankers flying flags of convenience are expected to oppose any restrictions on them.

The UN Conference on Trade and Development (Unctad), host to the talks, estimates 28 per cent of the world's shipping tonnage sails under the flags of Liberia, Panama, Singapore or 12 other states which allow foreigners to register ships. Reuter

World Economic Indicators

TRADE STATISTICS

	Feb. '82	Jan. '82	Dec. '81	Feb. '81
W. Germany DMbn	Exports 34.50	31.40	35.95	30.20
	Imports 30.80	30.20	30.81	29.30
	Balance +3.60	+1.10	+5.14	+0.90
U.S. \$bn	Exports 18.704	18.737	18.885	19.764
	Imports 19.090	22.829	19.746	22.910
	Balance -0.387	-4.092	-0.861	-3.146
UK £bn	Exports 4.278	4.661	4.713	4.813
	Imports 4.410	4.326	4.772	3.317
	Balance -0.132	+0.335	-0.790	+0.496
Japan U.S.\$bn	Exports 10.246	14.242	11.567	9.306
	Imports 11.045	12.020	10.951	10.718
	Balance -0.799	+2.222	+0.616	-1.412
France Ffr bn	Exports 51.54	51.27	50.70	40.84
	Imports 58.59	59.16	57.40	46.74
	Balance -7.05	-7.89	-6.70	-5.90

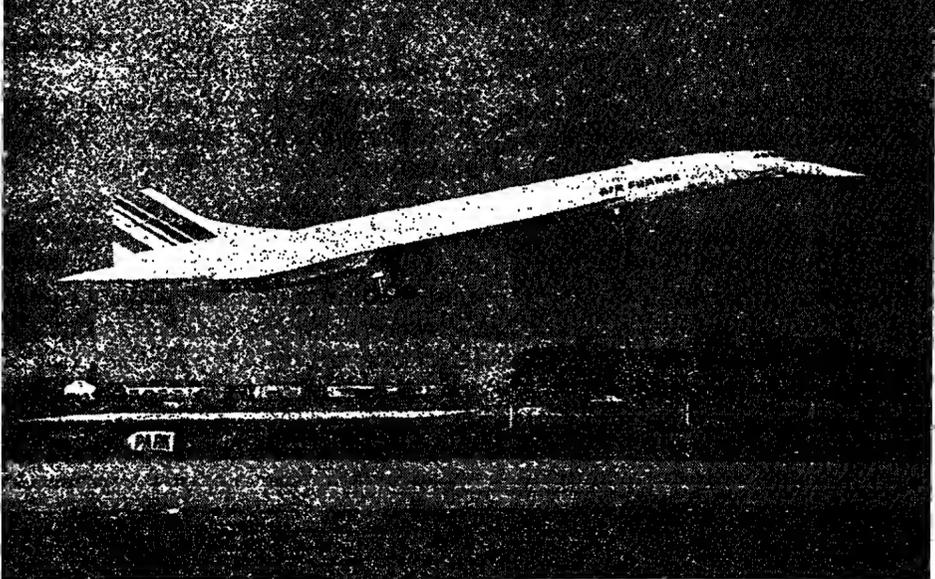
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Local sites rejected for \$20m factory

By John Elliott, Industrial Editor

A MILK products factory costing \$20m (\$11.4m) has been planned in the Netherlands by Bristol-Myers, a U.S. based pharmaceutical company, which has rejected two sites in the UK.

But the company yesterday denied suggestions made by Mr Patrick Jenkin, Industry Secretary, that it had decided against the UK because its executives had been caught recently in Britain's train drivers' and airport baggage handlers' strikes.

Mr Jenkin met senior Bristol-Myers executives during a recent 10-day tour of the U.S. He said he also met at least seven American companies which were considering expanding their British plants. These companies were impressed by the UK's improved labour relations.

"But one company—Bristol-Myers—said that they were convinced by the combination of the baggage handlers' and railway strikes that nothing has changed and they are going to Holland instead of building in Wrexham," said Mr Jenkin in his return.

"You can't keep Americans waiting for two hours for their luggage and then the next day have no trains to take them where they're thinking of investing," he added. "Mr Leroy McBrien, a vice-president of the company in New York, who met Mr Jenkin yesterday denied that labour relations were a factor in the decision. He had told Mr Jenkin that strikes like the baggage handlers' damaged the international view of British labour relations, despite the overall improvements, but company executives had not been affected.

"It is ridiculous to say labour relations stopped us investing," he added.

The company's board would be recommended during the next two months to build in Holland. The UK has been "very close to being a possibility," but had been put out because of a combination of factors including inflation forecasts, construction costs and availability of raw materials such as milk.

In any case, Bristol-Myers, which already has four production sites in the UK employing 700 people, is carrying out a \$6m pharmaceutical expansion project in Cramlington in the north-east. The other American companies which Mr Jenkin said were considering expanding in the UK included American Can, Fitey Fowes, Alcoa, Allegheny International which owns Wilkinson Match and Raytheon which owns Cossor. From California's Silicon Valley area, Tandem Computers, which is expanding at 30 per cent annually and Dyan, which makes computer discs, were also considering UK expansion.

Expansion for Mercantile House

MERCANTILE House Holdings, the leading London money broking company that recently acquired Charles Fulton Holdings for \$8.5m, is planning to expand its fund management activities into unit trusts.

The group has set up a new fund management subsidiary and taken on Mr Alan Maidment as one of its directors. Mr Maidment announced early last month that he was resigning as managing director of the Britannia Group of Investment Companies, after 13 years with the former Slater Walker subsidiary.

Rolls-Royce wins Saudi contract

Rolls-Royce has been awarded the contract to equip an overhaul base for RB-211 engines, being set up in Saudi Arabia at a cost of \$23m by Saoudia. The Saudi national airline is the largest operator in the Middle East of RB-211-equipped Boeing 747 and Lockheed TriStar passenger jets, of which it has a total of 19. Rolls-Royce is also to carry out initial training of Saudi staff at the base.

Enterprise zones rates revision

BUSINESSSES just outside new enterprise zones may qualify for a rates revision if they can show that creation of the zones constitutes a "change in locality," says Mr Nicholas Ridley, Treasury Minister.

CEGB plea on coal imports hits a sore point

By MARTIN DICKSON, ENERGY CORRESPONDENT

THE Central Electricity Generating Board (CEGB) has told the Government it wants to increase substantially its coal imports this year—a move which could provoke conflict with the mining unions.

The CEGB's plan poses a dilemma for the Government. It must decide whether to allow the increased imports or to renew an agreement reached last year under which the board

received financial compensation for keeping its imports to an "irreducible minimum."

The agreement kept CEGB imports to 750,000 tonnes in 1981-82 instead of the 2m tonnes planned. It formed part of a coal industry rescue package, assembled by the Government in February when it was threatened with a miners' strike over pit closures. The CEGB is under contract

until 1983 to buy 2m tonnes a year of Australian coal. Because of last year's import restrictions, it has been stockpiling this in Rotterdam where it now has about 1.5m tonnes.

With an additional 2m tonnes coming this year, the board could face stocking problems unless it increases imports. Because the international coal market is weak and supplies plentiful, it would not obtain a

good price if it tried to sell the Australian coal on the continent.

Discussions with the Department of Energy appear to be at an early stage. The CEGB would only say: "We have had negotiations with the department and it has requested us to keep imports down. But there is no decision yet on what the level will be." Imports represent a small pro-

portion of the 75-80m tonnes of coal the CEGB burns each year. At least 75m tonnes come from the National Coal Board.

But the CEGB has been anxious to maintain a toehold in the world market. It was furious when the Government demanded import cuts last year. The CEGB argues that import competition, however limited, helps it to hold down the NCB's prices and also gives it addi-

tional security of supply. During the past few years, imported coal has generally had a price edge over NCB supplies at Thames power stations, although not inland. The CEGB stressed recently that it intended to go on importing "to keep a further edge in our negotiations with the NCB."

The Government's limitation on imports came in for sharp attack last month from the Commons Select Committee on Energy, which said: "The interests of the consumer and taxpayer were not uppermost in the minds of ministers when they reached their decision."

However, any move to increase coal imports will be attacked by the National Union of Mineworkers, which will regard it as a threat to British colliery jobs.

NCB faces multi-million tonne problem in Scotland

MR BILL SWIFT has a multi-million tonne weight on his shoulders.

As marketing director of the National Coal Board (NCB) in Scotland, he faces the difficult task of selling 8m-9m tonnes of coal this year—at a time when the market for the fuel has shrunk dramatically.

Throughout the UK, the NCB's markets have been hit by the recession. But Scotland is suffering more than many of the other 11 areas into which the NCB divides the country. "There's no doubt we have a major marketing problem for the next few years," says Mr Swift.

A blow fell on New Year's Eve when British Aluminium closed its smelter at Invergordon, in the Highlands, because of the high cost of electricity.

That means lower demand for electricity—and therefore lower demand also for coal to burn in power stations. Unless Invergordon opens again—and a rescue package now appears unlikely—the NCB will lose about 750,000 tonnes a year in

sales to the South of Scotland Electricity Board (SSEB).

An even bigger blow will fall this summer when Peterhead power station starts to burn natural gas liquids (NGLs) from the North Sea. Peterhead has in the past run on oil, making it more expensive to use than Scotland's three coal-fired stations.

But in the interests of energy conservation, Peterhead is to use NGLs which would otherwise be wasted for the next three to four years, until the large petrochemicals complex being built at Mossburn, in Fife, is ready to use the NGLs as a feedstock. The liquids are expected to replace more than 1m tonnes of power station coal a year until Mossburn comes on stream in 1985/86.

With coal purchases by the SSEB likely to fall from 7.5m-8m tonnes a year to 5m-5.5m tonnes over the next few years, the NCB is undertaking a major drive for alternative markets—particularly abroad. During the past year, Scotland has ex-



COAL IN SCOTLAND

ported its first coal for a decade.

Despite the export drive, the NCB will probably have to put more than 1m tonnes of coal to stock over the coming year, increasing the costs of what is already one of its heaviest-lossing areas.

Big losses must in turn put increased pressure on the NCB to shut down its most unprofitable, elderly capacity. Old pits and difficult geologi-

cal conditions mean that Scotland's pits have been in decline for years. During the past five years, production from deep mines has dropped from over 8.5m tonnes to 7.15m tonnes in 1981/82. Eight pits have closed, leaving 14 in production, and manpower has dropped from 22,100 in 1976/77 to 17,500 now.

But the idea is to stabilise deep-mined production at about 7m tonnes a year. This, together with profitable open-cast mining

capacity of 2.5-3m tonnes, will give Scotland a total output of 9.5-10m tonnes.

To stop the decline, the NCB is speeding £105m on the modernisation of Scottish pits, three of which are closed for major development work. This programme, combined with the closure of exhausted old pits, has led to a 8.4 per cent rise in productivity over the past year, and a similar improvement is expected in 1982/83.

The investment programme is modest compared with those the NCB is undertaking in other parts of the UK. But local NCB officials hope it will change a deep-mining operating loss of £29m in 1980-81 to break-even by the mid-1980s.

However, as Mr John Loudon, the area's deputy director admits: "Much of that expectation depends on markets and prices over the next few years."

So what are Scotland's sales prospects in the 1980s? On the export side, the NCB has managed to ship out 500,000 tonnes

over the past year through the port of Leith, mainly for the Scandinavian market. A further 500,000 tonnes a year is going out through Ayr to Northern Ireland.

Lack of port capacity makes it hard to export more at present. But the NCB has held lengthy discussions with British Steel on the possible use of the corporation's Hunterston iron ore import terminal.

The NCB would have to spend some £3m to turn Hunterston into an export terminal, but it would then be able to push about 1.5m tonnes a year through the port in vessels of very large tonnage—provided it could sell that much.

However, last year's shortage of global coal supplies has turned into a glut. It is questionable whether the NCB will reach its target.

Against this background, Scotland's coal stockpiles look like mounting for several years to come, posing either a threat to jobs or a substantial cost to the taxpayer in aid to the NCB.

Solid fuel prices cut

EASTER MONDAY was cut-price-coal day for householders throughout the UK. Until July 31, supplies of solid fuel from the National Coal Board (NCB) and its subsidiary National Smokeless Fuels to coal merchants are reduced in price.

There is \$5 a tonne off house coal and anthracite stove and stove mats, \$7 a tonne off all other domestic grades of anthracite, Welsh dry steam coals, sunbrite and homefire, and \$3 a tonne off phreanite and firelog.

NCB chairman, Sir Derek Ezra, said: "Householders stand to gain substantially by ordering their coal now. With these reductions, and the industry's successful efforts to keep the last price increase well below the level of inflation, coal is now a particularly good buy."

Coal merchants reduce their retail prices in the early summer to help householders to save money by stocking up for the following winter.

Cap and gown—and underpants

By Anthony Moreton, Textiles Correspondent

AN UNLIKELY alliance has just been made between one of Britain's leading manufacturers of men's underpants and one of its oldest universities.

The object: to produce better and cheaper underpants and to repulse cheap foreign underwear and provide more work for Britain.

The link is between Lyle and Scott, maker of the renowned Jockey and Y-Front brands, and Durham University. The company, part of the Courtaulds group, has put up £105,000 over three years. This has been supplemented by another £75,000 provided by the university from a Science Research Council grant.

Research

The research programme will investigate ways in which robotics could help maintain profits in a highly competitive market. Lyle and Scott hopes that the results will revolutionise automation in the needle trades, not only in its own Dunfermline, Carnoustie and Gateshead plants but throughout the industry.

Like so many companies in the garment industry, Lyle and Scott is heavily dependent on women workers and traditionally faces a high staff turnover which averages at around a third of all machinists each year.

Mr John Russell, managing director of the company's Jockey division, states that it is looking for ways of ensuring that training costs are not dissipated in staff turnover. Robotics could provide the answer, he believes.

Training

By equipping skills to be built into machines, workers could be cheaply trained in several jobs. Mr Russell foresees considerable savings in training times as well as improved quality.

"Robotics could enable us to be in business and prospering in 10 years' time. The majority of the textile industry is vulnerable to low-cost imports and new technology could help home producers to remain competitive."

Lyle and Scott has already had considerable success with new machinery. At Gateshead plants ensure that sizing remains uniform throughout the production line.

Using micro-chip technology the device enables workers to turn out goods faster and more accurately, improves productivity and allows higher wages.

Colleges and industry forge research links

By DAVID FISHLOCK, SCIENCE EDITOR

GOVERNMENT initiative in encouraging British universities and industry to collaborate more closely in exploiting genetic engineering, is already claiming tangible success.

Two collaborations have just been announced in London, and a third involving a consortium of large British companies is at an advanced stage of planning in Leicester. The Government's Science and Engineering Research Council set up a biotechnology directorate to help such work. The directorate expects to spend £2.5m over the next five years in encouraging links between universities and industry.

Both the Government and industry believe this is more likely to advance national interests in bio-technology than the creation of 20 or more university posts, as the Government's scientific advisers recommended in the Spinks Report in 1980.

University College, London, has won a contract worth about £140,000 from a U.S. company to develop a production process for a powerful new pain-killer, called panepanetic endorphin. The endorphins are natural proteins, which act like morphine, but are free from the addictive side-effects.

Panepanetic endorphin is believed to be able to reach the brain after intravenous injection, and could thus prove to have great commercial potential.

More exhibitions planned

By TIM DICKSON

MORE exhibitions are being planned for later this year aimed at encouraging British companies to pick up orders for products currently imported into the UK.

The news follows the overwhelming response to the "Can You Make It?" exhibition which opens at the Confederation of British Industry's Centre Point headquarters tomorrow.

At the exhibition about 50 large UK companies will be seeking British manufacturers for 600 of their products currently being imported from overseas producers. These products, which represent orders worth £10m a year, will be on display at Centre Point, and more than 2,000 mainly smaller businesses have now made firm bookings to attend.

To satisfy demand, the organisers have decided that the exhibition, which was due to end on Thursday evening, will stay open on Friday morning. The "Can You Make It?" idea was the brainchild of the London Enterprise Agency.

Mr Ernest Saunders, the group managing director of Arthur Guinness, marked the start of his second six months at the Guinness holiday interests to English China Clays PLC for what the City considered the good price of £13.2m.

It was the third such sale that Mr Saunders had completed within a month. It was also part of his effort to revitalise the brewing company, which became involved, during the 1960s and 1970s, in such activities as film finance, plastics, holidays, and leisure goods, as well as the traditional brewing of stout. Guinness made pre-tax profits of £41.8m on a turnover of £905.6m for the year ended September 26, 1981.

Carbodies' farm truck conversion

Financial Times Reporter

CARBODIES, the London cab-makers, is entering the agricultural market in the autumn with a converted Range Rover designed to meet demand for a fast, lightweight vehicle for spraying, pesticide and other work.

Coventry

The Coventry company has spare capacities for up to 100 other vehicles a week. The Unitruck uses the front of a Range Rover with a crew cabin, behind which is a pickup body capable of carrying up to 11 cwt.

An impervious barrier isolates the passenger compartment and allows agro-chemicals to be carried. Provision is also made for attaching equipment. Up to fivefold increases in productivity over conventional tractor operations is claimed.

Attachments

The £13,500-£14,000 Unitruck is roughly equivalent to the Fleetline Range Rover in specifications. With sprayer attachment the price is expected to be £20,000.

The Grant Lockhart, managing director of Carbodies, said the company had an application before customs and excise to relieve the Unitruck of car tax, which is about £1,000. With VAT, this amounts to some £3,000 for the whole vehicle.

Legislation

"We are overhung with legislation from the horse and cart age and if we are to combat Japanese pickup imports and build up UK exports we need more up to date thinking," he said.

Mr Michael Pearce, a farmer and head of a Dorset agricultural company that made the original conversion, said he had to run over 30,000 acres of cereals once a month. That took too long in a tractor, which moreover compacted the ground.

Upturn expected in engineering sales

By MAURICE SAMUELSON

THE British engineering industry, which has strengthened its profits by cutting its costs, is expected to enter what Laing & Cruikshank, the London stockbrokers, sees as a second stage of recovery by increasing its volume of sales.

In a quarterly review of the engineering and motor sector, it suggests that capital spending on plant and machinery, after reaching its lowest point in the third quarter of this year, will recover. By the first quarter of 1983 it should be about 4 per cent higher than the 1981 average and possibly 14 per cent higher than the lowest point in 1982.

Assuming a 4 per cent volume increase in 1982, due to restocking, a further 4 per cent

fall in numbers employed, and a 7 per cent rise in sales prices, it expects margins to improve from 2 to 5 per cent during 1982. Also in 1982 the upturn in capital investment and recovery in overseas markets should permit a volume increase of 6 per cent.

However, the growing recession in South Africa means that companies which have relied heavily on trade there will see profits cut. Other UK engineering companies will be hit badly by their involvement in the U.S. motor industry, which slumped in January.

Although most UK companies in the machine-tool industry are losing money, the report says there are signs that the worst is over and a marked upturn in demand is expected in 1983.

Demand for new homes up

FINANCIAL TIMES REPORTER

A MARKED upturn in confidence is taking place among house buyers with an upsurge in demand for new housing, according to the House Builders' Federation.

It says that a quarterly survey of 273 householders carried out in the wake of the Budget shows an improvement in all sectors of the market.

Mr Roger Humber, the Federation's director, said the survey showed "that 1982 will be an excellent year for house buyers."

Some 57 per cent of companies reported an increase in interest by first-home buyers, with only 7 per cent reporting a fall. Existing owner-occupier interest improved for 58 per cent of companies, while only 11 per cent experienced a decline.

Each result compared favourably with the last quarter of 1981 when only 10 per cent of builders reported an improvement over the previous quarter, says the federation.

Expectations of future sales are consequently high, with more than half (57 per cent) planning increased start-up in

1982, compared with only 31 per cent three months ago.

An indication that house prices have stabilised, after their recent decline, is reflected in the 59 per cent of builders expecting profit margins to be maintained or improved in 1982.

Employment on building sites is also expected to increase according to 51 per cent of companies; 21 per cent said they anticipated an increase of at least 10 per cent.

14 jobs go at Belfast airport

Increased charges at Belfast Airport have forced British Midland Airways to cut 14 jobs from its Belfast base.

British Midland has labelled airport charges there as among the highest in Europe. The Association of Professional Executive Clerical and Computer Staff (APEX) has demanded an investigation into the cause of the staff cuts, claiming his union had not been consulted.

Glossy draw of mail order adverts

By Belinda Nenk

WOMEN'S clothing and personal products, such as jewellery, dominate the response to mail-order advertising in the November survey to March.

Clippa, a research service launched this month by Marketing Direction, a marketing and research consultancy, says these two types of product accounted for 57 per cent of all direct response, mail-order advertising in the five Sunday colour supplements—and Barclaycard magazine.

Clothing

Women's clothing attracted £3.5m worth of business, with kitchen, dining and personal products fetching more than £2m each.

In terms of overall direct response expenditure, the Sunday Express Magazine is getting the greatest revenue (32 per cent), followed by the Sunday Times Magazine (22 per cent) and the Sunday Telegraph Magazine (19 per cent). The News of the World's Sunday magazine is struggling to penetrate the market, with only 11 per cent of all revenue.

Clippa appears to dismiss the idea that a better response to mail-order advertisements is achieved by taking right-hand pages.

During 1981, 7.5m coupons were distributed in Britain, according to Nielsen Clearing House, the coupon-handling company. A 60 per cent increase on the total in 1980 largely resulted from retailers' distribution of coupons, previously used almost exclusively by manufacturers.

Coupons

Consumers redeemed 324m coupons, valued at £23m, in 1981. This was 30 per cent more than in 1980, the company said.

Consumers seem to prefer coupons they have taken from a pack. But more people are using coupons delivered to the door, often by the Post Office's household delivery service. Fifteen per cent of all coupons redeemed were distributed in this way in 1981, compared to only 4 per cent in 1980.

New broom makes a sweeping start at Guinness

Gareth Griffiths looks at Mr Ernest Saunders's progress

ton and Dudley for more than £2m. The Guinness Veterinary group, an animal medicines business, was sold in January to Gramplan Holdings for £1m.

The £20m-plus raised by the four sales will be used to reduce the company's borrowings in 1982-3 and to create greater flexibility in financing. But Guinness argues that as much importance should be attached to the fact that the company at least was seen to be acting, rather than talking about it.

In the past six months, Guinness has been subject to a series of management reviews initiated by Mr Saunders. He asks two fundamental questions of each of the companies in the group: What is the long-term potential of the business? What can the company do to be more efficient?

of other companies. It was to ask these obvious, but difficult, questions that the Guinness family brought in Mr Saunders six months ago as a new broom. He had been on Nestlé's central management committee in Switzerland and his meteoric career in international management gave him experience of the countries in which Guinness operated.

His first six months were busy and the activity impressed City analysts. The share price rose from 53p on October 1 to 82p last week.

The new broom was sweeping four main fronts.

Meeting with many people in the UK, Ireland and continental operations as possible, so as to get a feel for the business. Mr Saunders also set up a simplified company reporting system to give him more information, more quickly, about the company's performance.

ment reviews, each conducted by a project development team. The decision to end Guinness's advertising account with J. Walter Thompson was taken after three months, when Guinness decided that the advertising of stout, was too sophisticated for its consumers, and when research showed that people talked about the advertising rather than the brand.

A change in emphasis of management style—towards marketing rather than production. This change has been concentrated in two areas in the rest of British brewing, but Guinness management traditionally has been rather old-fashioned in its approach. Many managers spend entire careers with the company and often are unaware of others' methods and approaches. This shift will probably be more gradual than those in other aspects of the company. So far two senior executives associated with film financing and beer

marketing have left the company.

Retrenchment—and disposal of companies that no longer fit Guinness's overall strategy aimed at returning to its more traditional brewing role.

Having got out of confectionery and the risk side of film finance, the company is less keen on disposing of its plastics interests. It says parts of the plastics are very dynamic. Moulding work has been concentrated in two plants, instead of three, and Clares, a company that manufactures and supplies supermarket shopping baskets, has expanded its share of the market.

Guinness still has serious problems. The mainstay of its traditional business, stout, only accounts for 4-5 per cent of the UK beer market and Guinness drinkers are an ageing breed. The company has always lacked

a tied estate base and so is in a difficult position when bargaining with other brewers over trade discounts. Guinness, it is believed, now intends to reduce the credit period.

Guinness's stout often costs considerably more in brewers' managed houses than premium bottles.

Profits in Ireland have come under strain because of increased taxation there on beer and the Irish punt's decline against sterling. This is especially important because the Irish subsidiaries contributed 62 per cent of trading profits in 1980-1981.

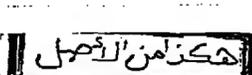
The review of brewing will be completed towards the end of the next six months and is almost certain to call for improved productivity. Park Royal, the main Guinness plant in west London, lags behind similar-sized plants in output per employee. Also, the overseas companies will be subject to scrutiny. Mr Saunders will start a series of overseas visits this month to launch the process.

Viking Resources International N.V.

Curacao, Netherlands Antilles

In the Annual General Meeting of Shareholders held on 8th April, 1982 a cash dividend of US\$ 0.43 per ordinary share was declared payable as of 20th April, 1982 on the ordinary shares against delivery of dividend coupon no. 10 with

Pierson, Holding & Pierson N.V. Herengracht 214 Amsterdam



Petrochemical plant threatened in tax wrangle

BY SUE CAMERON, CHEMICALS CORRESPONDENT

THE Government appears to be ignoring BP Chemicals' demands for tax concessions on North Sea petrochemical raw materials—and fears that the company may shut one of its plants at Grangemouth in Scotland, are growing.

BP Chemicals has made it clear to Ministers that the 250,000 tonnes-a-year petrochemical plant will be viable only if it can be converted to use North Sea ethane gas as a raw material, as well as oil-based naphtha. But a £25m project for conversion would not be economic unless the company were to obtain tax concessions on the ethane gas from the Government.

The Finance Bill that followed the Budget evidently makes no provision for a tax deal with the company—although BP Chemicals said at the weekend its experts were still studying the relevant clauses.

What the Bill would do, however, is to formalise a secret tax agreement made by the Government last year with Shell and Esso—two of BP Chemicals' main rivals. Shell and Esso are building a £500m petrochemical plant at Mossburn in Fife, which has been designed to use ethane gas from their Brent field as raw material. Last year Esso Chemicals wrung a special tax deal for the gas from the Government after threatening to abandon the Mossburn project.

North Sea ethane is subject to the usual 70 per cent Petroleum Revenue Tax, which is to go up to 75 per cent at the start of next year. Shell and Esso will be using their Brent ethane, at Mossburn and will be able to agree

a comparatively low, in-house transfer price. The Finance Bill would require the Inland Revenue to accept in-house transfer prices for tax purposes, as long as it were satisfied that they are comparable to prices that would have been agreed by unassociated companies.

This would effectively give Shell and Esso a free hand because there are no such comparable contracts for the sale of ethane as a petrochemical raw material in the UK.

The Finance Bill also proposes that, once an in-house ethane transfer price is agreed between the companies and the Inland Revenue, it shall be binding for tax purposes, for five years after the first delivery of the gas. At present, the Inland Revenue has powers to revise every few months the price it will accept for tax purposes.

The introduction of the new five-year rule is understood to have been one of the main parts of the secret deal between Esso Chemical and the Government last year.

BP Chemicals' problem is that it has little ethane gas of its own. It would have to buy ethane to go ahead with conversion of the Grangemouth plant, and it could find itself paying tax at a much higher rate than Shell and Esso.

The extra tax costs almost certainly would make BP's planned conversion of the Grangemouth plant uneconomic. The UK, like the rest of Europe, is suffering massive over-capacity in basic petrochemicals, so the alternative to conversion probably would be closure—particularly as the Grangemouth plant is old, having been built in 1968.

Irish plan offshore gas pipes to foil terrorists

By Brendan Keenan in Dublin

THE PROPOSED natural gas pipeline from Dublin to Belfast may be laid offshore as a way of preventing terrorist attacks.

This is one of the options being considered by Irish Republic and Northern Ireland officials who are considering the piping of gas from the Kinsale field off Cork.

The two governments have decided in principle that the pipeline should be built and the thinking behind the offshore installation, which would make little difference to the economies of the scheme, is that in shallow coastal waters, it would be much more difficult for terrorists to attack the line.

Mr Albert Reynolds, the new minister for Industry and Energy, has ordered an investigation into Irish energy prices, which are among the highest in Europe.

The Irish Government, which applies price control through a national prices commission, has already ordered petrol companies to cut their prices by an average eight pence a gallon.

More N. Ireland textiles jobs threatened

Workers at Dungannon are trying to avert the closure of Courtaulds' local dyeing plant. Tim Dickson reports

ON A CLEAR day, it is said, you can see all six counties in Northern Ireland from the highest piece of ground in Dungannon. The vantage point for this view is the site of an old castle where the proud O'Neills, the Earls of Tyrone, kept the armies of Elizabethan England at bay.

Today, however, the 25,000 inhabitants of the town and a good many others in the embowered "province" (as Northern Ireland is often referred to locally) are hoping desperately that an English-owned multinational will not go away.

For if Courtaulds, the UK textiles company, carries out a threat to close Brown and Adam, the dyeing and finishing part of the world famous Moygashel company, Dungannon will shortly become one of the worst unemployment blackspots in Europe.

Already, 34 per cent of the men in the area are out of a job but the proposed closure will take this figure to not far short of 40 per cent.

According to the group representing the 500 workers at Brown and Adam there are also severe doubts about the 460 remaining jobs in the Moygashel group and if these were to go the unemployment total could reach an unprecedented 50 per cent. (Confidence was not im-

proved by the announcement on Thursday that Steegun, another Courtaulds subsidiary in Belfast, is also going to be closed.) Moygashel has for generations been the main employer in a town which lies roughly 35 miles to the west of Belfast and at its closest point is only about 12 miles from the border with the Irish Republic.

It has one of the most impressive histories of any textiles business in Northern Ireland. Its origins go back to the end of the 18th century when two brothers set up as flax merchants in the area.

Moygashel Mills, the factory which made and still makes these fibres into some of the most famous Irish linen in the world, was not started until 1875.

Many of the families who worked in Moygashel in the early days are still connected with the works which lie in a small village of the same name on the outskirts of Dungannon.

The skills of these men and women contributed greatly to the growth of the business which merged in 1950 with a number of other Northern Irish family-owned companies to produce a powerful vertically integrated textiles group encompassing spinning, weaving, dyeing and finishing.

Moygashel became a publicly-quoted company in the 1950s

before being absorbed by Courtaulds in 1968.

The reputation of Moygashel linen in the U.S. opened up a major market for the group. But in recent years (particularly under Courtaulds' ownership) the emphasis has been firmly downmarket: in viscose rayon and polyviscose products.

Linen and linen mix whose main advantage when used in clothing is its coolness but which creases easily and is expensive, today account for only about 20 per cent of Moygashel output. The company's machines, however, still give the rayon fabrics a "linen look" which is an important marketing advantage in overseas markets.

Courtaulds' decision early last month to close Brown and Adam and move dyeing and finishing to another site in Rochdale, Lancashire, has come as a hammer blow to the whole community. The 460 jobs which will remain in Moygashel (about 190 of them at the Braidwater Spinning Company in Ballymena, Co. Antrim) compares with the 3,000 to 4,000 employed in the early 1950s and about 2,000 when the UK group took control in 1968.

Courtaulds believes Brown and Adams is no longer viable. It points to losses running into hundreds of thousands of pounds in the year to March last year which are still continuing. Com-

Around Britain: DUNGANNON



petition from cheap imports and the recession in the textiles sector are to blame, as well as the high overheads of the Moygashel works.

The works action committee, however, has other ideas and points out that the Moygashel group as a whole made a £1m profit in the year to March just ended. With the support of Ulster's three Euro MPs, local councillors and transport union officials are putting forward an £8.4m modernisation plan as an alternative to closure. Local management had already tried to get this sort of commitment from Courtaulds without success.

Meetings between the Northern Ireland Department of Commerce (which would presumably have to provide the bulk of funds), Courtaulds and the action committee have so far failed to find an agreeable formula.

According to Mr Ken Woods of the committee the Government "has already agreed to put up £1.5m. Some of us were told at a meeting with Mr Christopher Hogg, Courtaulds' chairman, that the company might reconsider if the Government could find 75 per cent of the £8.4m. The Government therefore has in hand only another £2m which does not seem much compared with all the money they will need to keep people on the dole."

Moygashel's skilled and loyal workforce naturally feel that closure would bring about a big waste of human resources. Understandably, they also think that some of the funds which are apparently made so readily available for the likes of Mr John Z. DeLorean could be spared to avert the threat to them all and their community.

BP Chemicals has doubts on EEC wine agreement

BY OUR CHEMICALS CORRESPONDENT

BP CHEMICALS has expressed doubts about the safeguards designed to protect its synthetic alcohol business which have been written into a new EEC agreement on wine.

The EEC has agreed to an "exceptional" distillation into pure alcohol of 6.5m hectolitres of the European wine surplus. The cost of the exceptional distillation, in terms of EEC subsidies, has been estimated at £70m. But at the insistence of Britain, the agreement includes guarantees aimed at preventing the distilled wine alcohol being sold into the comparatively low-priced synthetic alcohol market.

BP Chemicals is Western Europe's biggest producer of synthetic alcohol and has just completed a £57m synthetic alcohol plant at its Grangemouth complex in Scotland. The company said at the weekend that the wine distillation agreement "goes some way to safeguarding the interests of the synthetic alcohol industry."

But it had "some doubts on whether the safeguards are sufficiently strong." It warned the agreement itself could lead to further over-production of wine in Europe—particularly while the intervention price set for exceptional distillation was so high. BP Chemicals is thought to be less worried about the latest, one-off agreement on wine distillation than about EEC proposals still under discussion—to distil surplus wine into pure alcohol on a compulsory and, probably, more regular basis. BP has warned the UK Government that pure alcohol

produced on this basis could cause permanent disruption if it were sold into the synthetic alcohol market at subsidised prices, as the EEC is proposing. Ministers have pledged support for the company's fight to prevent its synthetic alcohol business being jeopardised.

Synthetic alcohol—chemically similar to pure alcohol distilled from wine—is made from petrochemical raw materials and used in the manufacture of toiletries, cosmetics, industrial solvents and other products.

The current price of synthetic alcohol is about £500 a tonne. But Mr David Cronch, MP for Canterbury, said in a recent House of Commons debate on agriculture that the subsidised cost of distilling surplus EEC wine for the synthetic alcohol market would be "nearly £2,000 a tonne."

The safeguards in the latest agreement on exceptional distillation of wine are:

- Member States must tell the European Commission when they plan to sell distilled wine-alcohol, and give details of price and volume.
- The Commission will inform other member states and decide whether the proposed sale will disturb the synthetic alcohol market.
- If the disruption seems likely, the commission can either halt the sale or demand changes in planned price or volume.
- Prices have been set at 81.5 per cent of the EEC guide price under the exceptional distillation agreement. The present market price for wine is only some 70 per cent of the guide price.

Labour has modest hopes for local election success

BY ROBBY PAULEY

THE LABOUR Party hopes to gain control of three more London boroughs, making a total of 16 out of the 32, one metropolitan district (Dudley) and seven non-metropolitan districts, in the May local elections.

A frank analysis of the party's likely fortunes indicates that the Liberal and Democrats alliance is "throwing a spanner in the works" and that the Labour Party has largely failed to capitalise on Government unpopularity.

The party in London achieved a remarkably low swing-back of only 6 per cent in last year's Greater London Council election and if this is repeated next month its only London gains will be Ealing, Hammersmith and Fulham, and Wandsworth. Labour is hoping to hold its 13 London boroughs, although Lambeth could go to any party on the basis of its by-election results.

all 36 metropolitan districts, nine Scottish Regional Councils, and 103 of the 296 English non-metropolitan councils.

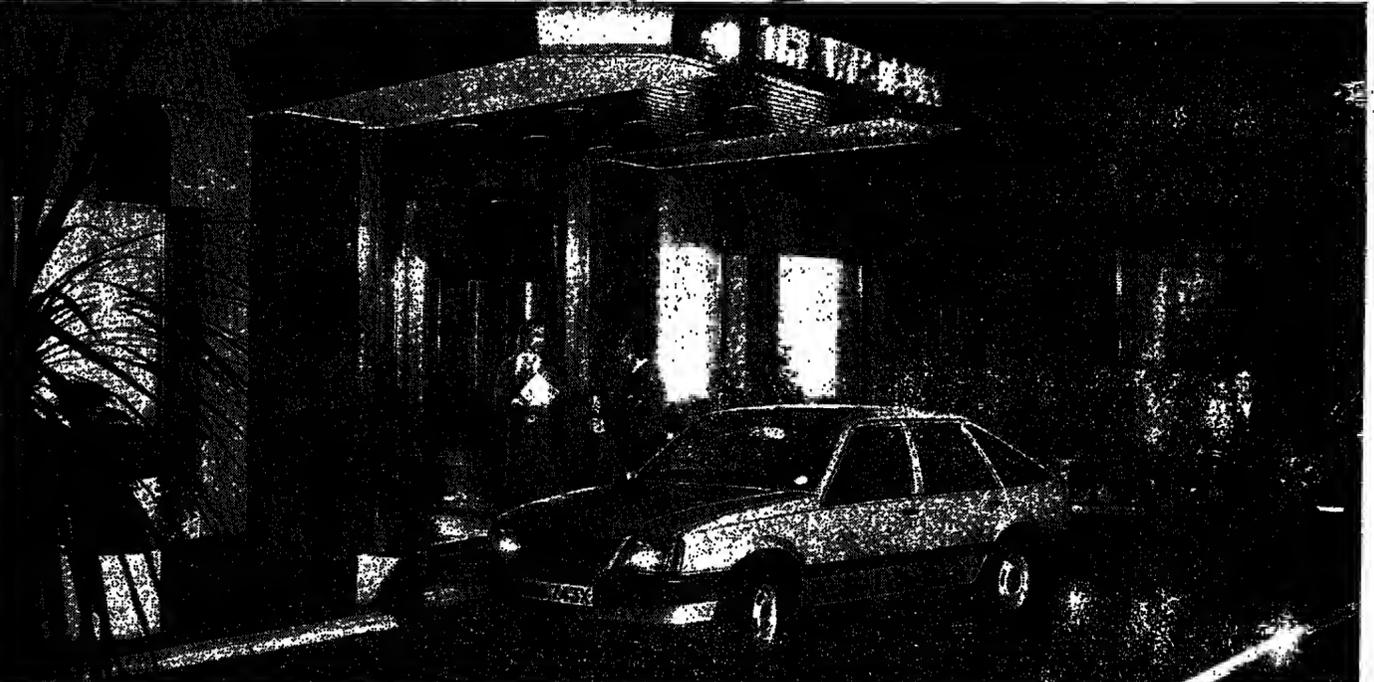
Labour already controls 27 of the metropolitan districts. Only 10 have full council elections, the rest elect the council in thirds annually. Labour has nine of these 10 and is the largest party in the tenth, Dudley, which it hopes to win. There is little scope for change of control this year in metropolitan areas where only a third of the council faces the electorate.

All of the non-metropolitan districts have a third of the council standing for election. Labour hopes to gain control of Cambridge, Milton Keynes, Basildon, Blackburn, Crewe and Northwich, Thurrock and Great Yarmouth.

Labour controls four of the nine Scottish Regional Councils and admits it will be doing well to retain them and keep its present 175 regional councillors out of a total 432.

A strong showing by the Alliance, particularly if it takes more support from Labour than Conservatives could make even these modest targets in England and Scotland unattainable for Labour.

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UK NEWS - LABOUR

'Divide and rule' fear on Clause 7

SOLIDARITY was a key concept of trade unionists well before Poland. So hardly surprisingly Britain's unions are wary of a provision of the Employment Bill, 1982, which they feel will give employers a ready-made weapon to divide and rule.

CLAUSE 7 of the Employment Bill gives employers the right to sack a striker under certain conditions. Philip Bassett looks at the implications.

concerned before the end of the specified period; and if an employer dismisses all employees still taking part in the strike.

Trade union officials believe that this provision was inspired by the tough tactics of Sir Michael Edwards, BL chairman.

In practice, an employer probably would be unlikely to divide militant members of the rest unless he sensed that a significant proportion of the strikers would prefer to return to work.

For unions paying strike pay - particularly white collar unions - the clause could have considerable financial implications.

The clause could also have implications for agreements on returning to work after a strike.

exploit the disadvantage usually sustained by one side or the other as a result of the strike.

Some unions have seized on one point in the clause which perhaps is not as restrictive as it might be.

The provisions of Clause 7 clearly do not go as far as the action against selective strikes called for by the Engineering Employers Federation.

Tomorrow: trade union immunities and the narrowing of the definition of "lawful" industrial action.

FT COMMERCIAL LAW REPORTS

Digest of cases reported in Hilary term

FROM JANUARY 4 TO FEBRUARY 3, 1982

Perdant Properties Ltd v United Orient Leasing Co. Sdn Bhd (FT, January 4).

When supermarket in Johore went into liquidation, its equipment concerned two parties: the landlords, who wished to distraint for unpaid rent, and the lessors of the equipment.

The Spanish government unexpectedly refused applications for export licences for foodstuffs in 1978, and the defendant sellers claimed protection of the Gatta form 100 which cancelled the contract of sale in cases of prohibition of export through government intervention.

The contention that shareholders of the same class could be given equal treatment was dismissed in the Chancery Court.

Office. However, telephonic acceptance is complete when the message is received. When the question of telecommunication arose, the telephone rule was held to apply to them, too.

When British Steel entered into a contract to manufacture steel rods, work was commenced at the defendants' request, "pending" a formal contract.

The Earl of Lonsdale's claim that he owned oil and natural gas under the seabed of the Channel was dismissed in the Chancery Court.

Another tax avoidance scheme came up for consideration before the Law Lords who, by a majority, again overruled the Chancery Court.

Mr Karamouz's brother died apparently on November 14, 1973 in circumstances pointing strongly to his death on that day or shortly thereafter.

Mr Justice Goff held that the defendants' contention that they could counter-claim for late delivery could not be sustained, while BSC was entitled to a reasonable sum for the completed work.

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reproducing the eye-catching homework which led to his being backed for a Guinness Derby double before his racecourse debut.

On the 1,000 Guinea front, the consensus now seems to be firmly behind the possibility that Simply Great's pilot, Lester Figgott, will win the race.

Now back in top trim and

Now back in top trim and

Advice to directors

THE INSTITUTE of Directors is sending its members advice on how to combat the TUC's campaign against Mr Norman Tibbitt's Employment Bill.

It points out that the TUC policy of calling industry-wide strikes in support of a union taken to court would probably be unlawful under the 1980 Employment Act.

Power engineers warn on plutonium exports to U.S.

POWER engineers and managers in Britain are threatening to reconsider support for future development of nuclear power, if civil plutonium is exported to the U.S. without satisfactory safeguards its use in an arms programme.

The Government has said any exports would be made only after assurances that the materials would remain subject to international safeguards under the U.S. treaty with the International Atomic Energy Agency.

Managers' unions bid for national EEF recognition

Federation is virtually certain to reject the approach, preferring to leave it to individual member companies to decide whether or not to recognise the two unions.

These two unions are already engaged in a battle with the EMA and Eesa to win managerial and professional members.

RACING

SIMPLY GREAT now stands shorter in the 2,000 Guinea bet than any of Guy Harwood's possible runners, and he is certain to start a hot favourite to account for Pulborough's Norwich and seven others in the Craven Stakes at Newmarket today.

Tieup with T... and give your top managers the peace of mind they need to get on with the job they are paid for. Running and building the business.

ICL increases weighting

MAJOR increases in the London allowance have been won by 2,500 members of the Association of Scientific, Technical and Managerial Staff (ASTMS) employed by International Computers (ICL).

Steel unions attack sale

THE TUC steel committee has condemned a "give-away" planned sale of British Steel Corporation's Redpath Dorman Long heavy engineering subsidiary to Trafalgar House for £10m.

Chris Dunkley: Tonight's Choice

Three fresh, if not strictly new series tonight: Young Musician of the Year and Play for Tomorrow on BBC 1 and Sorry I'm A Stranger Here Myself on ITV which is developing an unusually powerful Tuesday night.

LONDON

9.30 am World Famous Fairy Tales. 9.45 Wild World of Animals. 10.10 Animated Classics. 10.55 The First Day. 11.25 Paint Alog with Nancy. 11.55 The Bubbles. 12.00 Button Moon.

Tieup with T... Trade Indemnity Credit Insurance takes the risk out of credit. Please tell me the kind of service you could offer to my business.

Plessey faces 'loyalty' row

PLESSEY workers who offered to work while colleagues staged a sit-in over closure, say they are not going to be paid for their loyalty to the company.

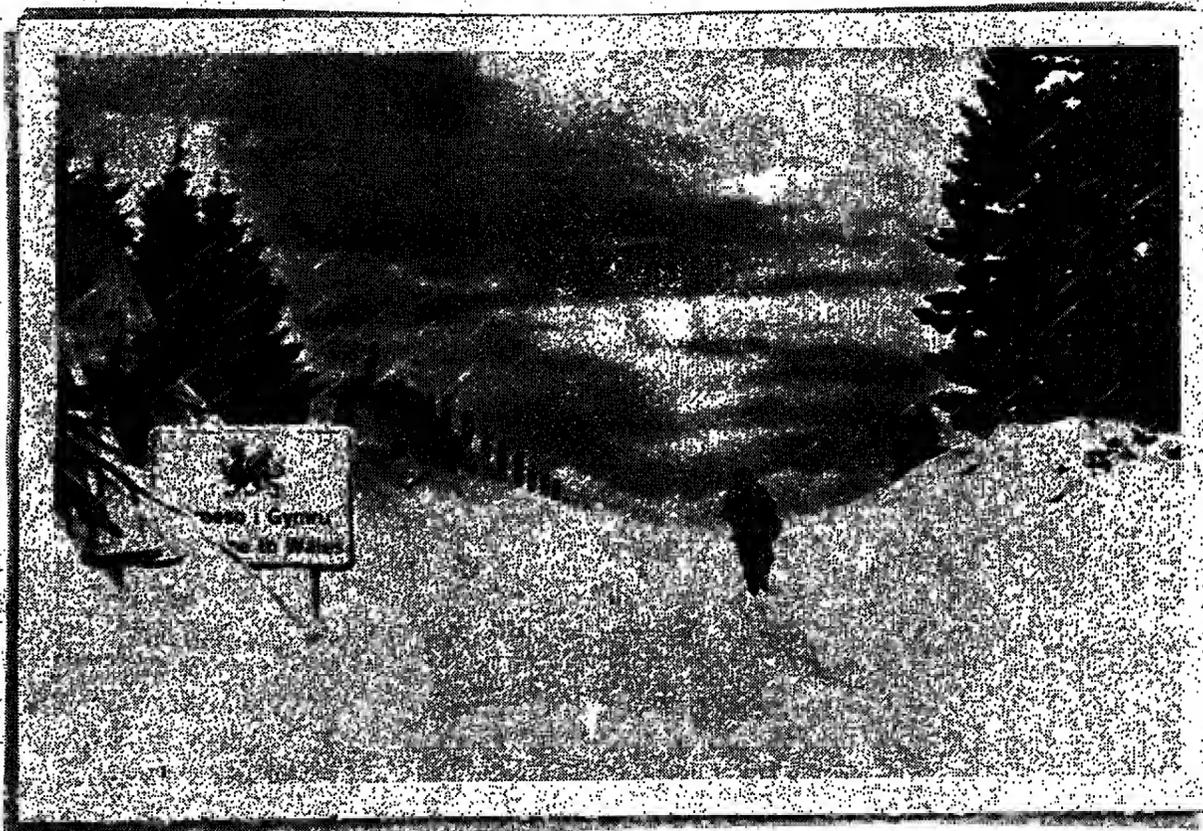
TELEVISION

BBC 1: 9.55 am The Wombles. 10.00 Jackanory with Bernard Cribbins. 10.15 Lassie. 10.25-11.00 Why Don't You... 12.20 pm News After Noon. 1.00 Pebble Mill At One. 1.45 The Plumpies. 2.00 The Goose Steps Out. 2.15 Songs of Praise from Wells Cathedral. 3.53 Regional News for England (except London). 3.55 Play School. 4.20 The All New Popeye Show. 4.40 The Record Breakers with Roy Castle and Tony Blackburn. 5.05 Newsround with Paul McDowell. 5.10 Break in the Sun. 5.35 The Pershairs. 5.40 News. 6.00 Regional News Magazines. 6.25 Inbetweeners. 6.30 The Bomb Disposal Men report. 6.55 Barney Bear (cartoon). 7.05 Young Musician of the Year. 7.40 CBBC. 8.10 Flesh and Blood starring Thora Hird, Bill Fraser, Nigel Stock and John Stone. 8.00 News. 8.25 Far Tomorrow. 8.35 Crimewatch with Caryl Churchill, starring Julia Foster and T. P. McKenna. 10.25 Snowdown on Camera. 11.00 News Headlines. 11.05 Harry O.

RADIO

12.00 News. 12.02 pm You and Yours. 12.07 Intensive. 12.55 Weather, sport, 1.00 The World at One. 1.40 The Archers. 1.55 Shipping Forecast. 2.00 News. 2.02 Women's Hour. 2.05 The Garden. 2.10 The Archers. 2.15 The Garden. 2.20 The Archers. 2.25 The Garden. 2.30 The Archers. 2.35 The Garden. 2.40 The Archers. 2.45 The Garden. 2.50 The Archers. 2.55 The Garden. 3.00 The Archers. 3.05 The Garden. 3.10 The Archers. 3.15 The Garden. 3.20 The Archers. 3.25 The Garden. 3.30 The Archers. 3.35 The Garden. 3.40 The Archers. 3.45 The Garden. 3.50 The Archers. 3.55 The Garden. 4.00 The Archers. 4.05 The Garden. 4.10 The Archers. 4.15 The Garden. 4.20 The Archers. 4.25 The Garden. 4.30 The Archers. 4.35 The Garden. 4.40 The Archers. 4.45 The Garden. 4.50 The Archers. 4.55 The Garden. 5.00 The Archers. 5.05 The Garden. 5.10 The Archers. 5.15 The Garden. 5.20 The Archers. 5.25 The Garden. 5.30 The Archers. 5.35 The Garden. 5.40 The Archers. 5.45 The Garden. 5.50 The Archers. 5.55 The Garden. 6.00 The Archers. 6.05 The Garden. 6.10 The Archers. 6.15 The Garden. 6.20 The Archers. 6.25 The Garden. 6.30 The Archers. 6.35 The Garden. 6.40 The Archers. 6.45 The Garden. 6.50 The Archers. 6.55 The Garden. 7.00 The Archers. 7.05 The Garden. 7.10 The Archers. 7.15 The Garden. 7.20 The Archers. 7.25 The Garden. 7.30 The Archers. 7.35 The Garden. 7.40 The Archers. 7.45 The Garden. 7.50 The Archers. 7.55 The Garden. 8.00 The Archers. 8.05 The Garden. 8.10 The Archers. 8.15 The Garden. 8.20 The Archers. 8.25 The Garden. 8.30 The Archers. 8.35 The Garden. 8.40 The Archers. 8.45 The Garden. 8.50 The Archers. 8.55 The Garden. 9.00 The Archers. 9.05 The Garden. 9.10 The Archers. 9.15 The Garden. 9.20 The Archers. 9.25 The Garden. 9.30 The Archers. 9.35 The Garden. 9.40 The Archers. 9.45 The Garden. 9.50 The Archers. 9.55 The Garden. 10.00 The Archers. 10.05 The Garden. 10.10 The Archers. 10.15 The Garden. 10.20 The Archers. 10.25 The Garden. 10.30 The Archers. 10.35 The Garden. 10.40 The Archers. 10.45 The Garden. 10.50 The Archers. 10.55 The Garden. 11.00 The Archers. 11.05 The Garden. 11.10 The Archers. 11.15 The Garden. 11.20 The Archers. 11.25 The Garden. 11.30 The Archers. 11.35 The Garden. 11.40 The Archers. 11.45 The Garden. 11.50 The Archers. 11.55 The Garden. 12.00 News.

“Colt kept us open when Wales closed.”



These fans create a cushion of air which holds the heat down at working level, where it belongs.

The results? In the first half of last winter alone, Rubery Owen Rockwell spent £10,000 less on fuel—a 41% saving on the previous year.

But last winter was no ordinary winter: allowing for the record low temperatures, and the company's longer working hours, Rubery Owen Rockwell estimate their savings at 67% in real terms.

And as the cold was closing down other factories, they also saved several working days, which would otherwise have cost them £70,000 in overheads.

Even so, under our no-deposit, extended credit scheme, the company has not yet paid Colt a single penny. So their new system is virtually self-financing.

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We'll give you a guaranteed figure for what you will save—at least 25% on average. And you'll also know just how long your investment will take to pay for itself—usually about 2 years. Naturally, the savings will still keep coming in year after year.

The added bonuses, however, are impossible to put into figures.

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And that's something even Santa Claus couldn't bring you.

Colt International Limited, (Heating, Ventilation and Energy Conservation), Havant, Hants. PO9 2LY. Tel: (0705) 451111. Telex: 86219.

The climate was hardly encouraging for industry in Wales last winter.

With Arctic temperatures and snowdrifts as high as houses, many factories were simply forced to close.

Yet Rubery Owen Rockwell Ltd., of Llay near Wrexham, kept up their production of heavy-duty trailer axles as if nothing had happened.

In fact, a great deal had changed since the previous summer. Colt had been to the Llay works and installed a warm-air heating system of modest capacity, but combined with some very clever energy-saving devices.

Computerised optimisers were used to make sure the factory was warm enough by clocking-on time. On bitterly cold days, they automatically start up the heating in the early hours.

But they also delay it at the first sign of a mild spell. And switch it off before the factory closes, so converting thermal lag into cash in the bank.

A system of Wastemaster Mk. II fans was also fitted, to counteract heat loss through the roof.

THE MANAGEMENT PAGE: Small business

Pooling resources to help large and small

James Buxton examines how an Italian entrepreneur has set up an American-style joint venture with Olivetti



Massimo Rinaldi: ruled out bank borrowing because "the high interest rates would have finished us off in the twinkling of an eye"

EVERY WEEK between 10m and 20m Italians fill in football pool forms on the 13 big games which are played on Sunday afternoon. Instead of sending them in by post they take them to their local tobacconist or bar...

largely installed, the winners should be announced while the crowds are leaving the stadium," says Rinaldi. Rinaldi is hardly one's idea of a typical Italian electronics designer...

of indigenous computer manufacturers that it claims to be the only significant Italian-owned computer manufacturer apart from Olivetti to have its own design capacity...

Stretched

The contract for up to 14,000 machines for Totocalcio, was agreed last month and will be worth £50bn over two years. It could bring in a total of £100bn over the next nine years...

With the possibility of having to quadruple its labour force and needing to increase its £1.5bn capital, Mael had to look for more financial backing...

Rinaldi — Mael bit upon Olivetti. Olivetti already had a policy of investing venture capital into small, technologically advanced and expanding companies...

1978 by some former Exxon executives. Under the agreement with Olivetti Mael's capital was increased to £2.5bn and Rinaldi's partner, an influential businessman named Franco Pesci, sold out to Olivetti...

Olivetti will supply some parts for the Totocalcio machines as it would have done anyway, and some of the machines and services may be made in Olivetti factories...

A fertile mind pouring products into an untapped market

MASSIMO RINALDI was one of the early Italians in the world of computers. In the early 1960s he designed what he claims was the world's first desktop computer...

design, was launched in 1970. New machines and derivatives were introduced at the rate of about one a year ever since, and, while its main market was West Germany...

involved in special products rather than off-the-peg computers and the relationship with Saga no longer made sense...

gearing up to produce machines for the automation of the postal banking system, through which many Italians pay their bills...

the train, and the range of supplements and accessories is formidable. In the immediate future Rinaldi has high hopes of exporting his football pools system to countries like Greece and Spain...

How does he do it? Casually demonstrating the personal computer that he designed which he has by his desk (but which he does not intend to market) he says: "I used to run the whole thing completely myself. Now I delegate a lot and do more design than management."

Publishers panned for ignoring 'gap'

AN UNFLATTERING critique of the current outpourings of American publishers on the subject of small business is given in the latest issue of Harvard Business Review. In classic entrepreneurial fashion many publishers have heeded the call for more and better information by rushing into print with new books, magazines and feature articles...

view and many adopt the attitude that "with persistence and common sense, entrepreneurial skills are easy to learn." The publications are by no means all useless, however. Many concentrate on short-term managerial and legal problems...

Small business abstracts

Capital budgeting in small companies. T. H. McInish and R. J. Kudva in American Journal of Small Business (US), Spring 81. Discusses the net-present-value approach to capital budgeting...

order supplies from James Hall and Co (wholesalers) by telephoning the company's computer and keying-in order quantities as each item appears on a visual display unit...

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TECHNOLOGY

Computer born in a 12th century castle

BY JASON CRISP

THE late Duke of Chablaise must have turned slowly in his grave. The 12th century castle he lovingly restored in the late 1870s was being used to herald an electronic vision of the 21st century.

Amid hundreds of paintings from Crivelli to Crespi at the castle of Aglie, in the beautiful Piedmont region in Northern Italy, Olivetti launched its personal computer.

Mr Carlo de Benedetti, vice-chairman and chief executive and major shareholder of Olivetti painted his own picture of work in the future. He said that by the year 2000 even conservative estimates suggested there would be 300m personal computers in the world.

Market share

At the end of last month two major established European companies dived into the already crowded pool of personal computers. Britain's own ICL and Olivetti joined the founders of the market like Apple, Commodore and Tandy as well as powerful newcomers on the scene IBM, Xerox and ITT. The only other major European company with a personal computer is Philips. Its P2000 has not been a success—it blames its selling outlets, and is expected to change tactics.

Recently ICL launched its already well publicised personal computer which it will sell through its newly set up dealer network, known as Tradepoint.

ICL's personal computer which will be made at its Kidsgrove factory in Staffordshire, is

based on the Rair "Black Box" computer and costs between £2,200 and £5,250. Olivetti which aspires to capture 10 per cent of Europe's personal computer market by the end of 1983 launched a rather more powerful 16-bit machine the following day.

ICL's personal computer like most others currently available is an eight-bit computer. The Olivetti personal computer costs about £2,900 which includes two floppy disc drives and a low cost printer, was designed at its U.S. research laboratory in Cupertino, California.

Mr Vittorio Levi, head of Olivetti's operations division said that the nature of the personal computer market involved a change in sales approach. He said new sales strategies had to be developed which were very flexible and spread over a number of distribution channels, most important of which were the indirect outlets such as sole agents, dealers and shops.

Third party

The basic machine will start around £1,900. It will be made in Italy at Olivetti's plant in Scarmagno at Ivrea.

ICL and Olivetti are joining a market which for five years was the sole preserve of small entrepreneurial companies. Last year that market changed as established companies like Xerox, Texas Instruments (second try), ITT and above all IBM began to offer personal computers.

In the U.S. the IBM personal computer (also 16-bit) starts at \$1,500 but a typical business machine with two floppy diskettes and a printer costs about \$4,500. It is not yet available in Europe and is not expected until the end of the year, although some rumours in the industry suggest it may be brought forward slightly.

Because the IBM personal computer is available in the U.S. from third party retail outlets, Sears Roebuck and Computerland, it is being bought from shops and imported into Europe un-

officially, to IBM's irritation. When the IBM personal computer becomes available in Europe it is likely to adopt a similar marketing strategy to the U.S. of offering the product through its own sales force, its own retail product centres and through third party retailers. However, there are fewer professional computer chains in Europe.

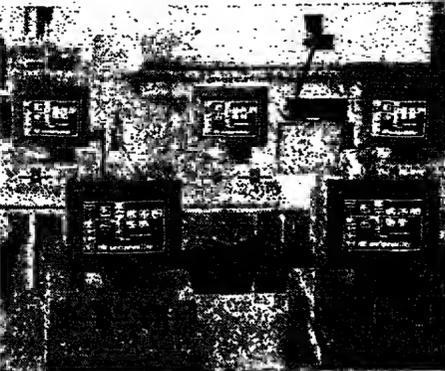
Olivetti has no plans, at present, to sell its personal computer, the M-20, through retail outlets. It will sell it directly to larger customers and is in the process in the UK of appointing a network of 100 dealers.

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He said new sales strategies had to be developed which were very flexible and spread over a number of distribution channels, most important of which were the indirect outlets such as sole agents, dealers and shops.

Three sections

In the UK and most of Europe the M-20 becomes available in the early summer and by September Olivetti hopes to have some 30 software packages available. These are divided into three categories: Commercial such as typical accounting programs, Scientific and Technical, such as structural analysis and what it calls International which includes wordprocessing and a financial modelling program, a so-called Visicalc lookalike. By the end of 1983 Olivetti



The Olivetti personal computer will cost about £2,900

hopes to be selling 80,000 computers a year.

The personal computer market is growing very rapidly but so are the number of manufacturers. In addition to the personal computer specialists, the minicomputer companies, giants like IBM and Xerox, there is the prospect of some fiercely competitive products from the Japanese including Hitachi, Toshiba and NEC. Some early sabre rattling from

Hitachi indicates plans to sell a personal computer in the UK around early next year, very much with the IBM launch in mind.

One of the most remarkable challenges is the newly launched Osborne computer which costs £1,250 in the UK including software for word processing and financial projections. In eight weeks it has sold £1m of computers in the UK alone.

Telecom's tiny radiopaging

THE WORLD'S smallest radiopager—about the size of a credit card—is to be used by British Telecom for its national radiopaging service.

The paper has been designed

by Multitone Electronics using a new signalling code developed by British Telecom. It can provide up to four distinctive tones, each of which can be stored in the pager's memory. More information on 01-235 7040.

Geothermal heat may be energy survivor

BY ANDREW HOLMES

THE GOVERNMENT is presently deliberating the future of various forms of alternative energy. Whatever may be the fate of some projects in the alternative energy field it is likely that heat stored in underground rock—geothermal heat—could prove to be one of the survivors.

About 80 per cent of the earth's surface is on top of rock which is not enough to be used economically for energy production.

The technology for extracting the heat is deceptively simple—drill two holes, connect them and circulate water through the system to produce low pressure steam at temperatures of around 200°C. But the process for fracturing rock at great depth with the necessary accuracy to connect two narrow boreholes is proving extremely difficult.

Two boreholes

The Camborne School of Mines, with a £2.7m grant from the Department of Energy, is working on a project to extract heat from the granite under Rosemanowes Quarry, near Penryn in Cornwall. The first stage involving the drilling of two boreholes 2,000 metres deep and 250 metres apart, has just been completed.

Boreholes are drilled straight down for two-thirds of the way and then deflected towards each other at a 30° angle.

The two holes are already

connected by the natural fissures in the rock but these must be widened to create a large enough surface area to make sufficient heat available.

The Camborne team will fracture the rock using explosives followed by the application of high-pressure water. The explosions will begin in July followed by water injection in October.

Steam pressure

Once the connecting fracture has been made, water at 20°C will be circulated in the system and the researchers hope that it will be at a temperature of around 80°C by the time it returns to the surface.

If tests show that the temperature of the water is consistent the next step will be to drill down to depths of 5,000 metres to 6,000 metres where low pressure steam at temperatures of 190°C are expected.

At such depths it is not certain whether the techniques of direction drilling—borrowed from the oil industry—can be carried out with sufficient accuracy. There are also question-marks about using explosives and pumping equipment at high temperature and pressure.

Camborne researchers estimate that two or three years would have to be spent developing suitable equipment before the deep experiment can begin. The complete project could take at least a decade.

Imaging for the robots

THE COMING need for automation systems and robots to be able to "see what they are doing" is generating new interest in the idea of obtaining images of parts under manufacture or test and processing them to produce data and instructions for the process.

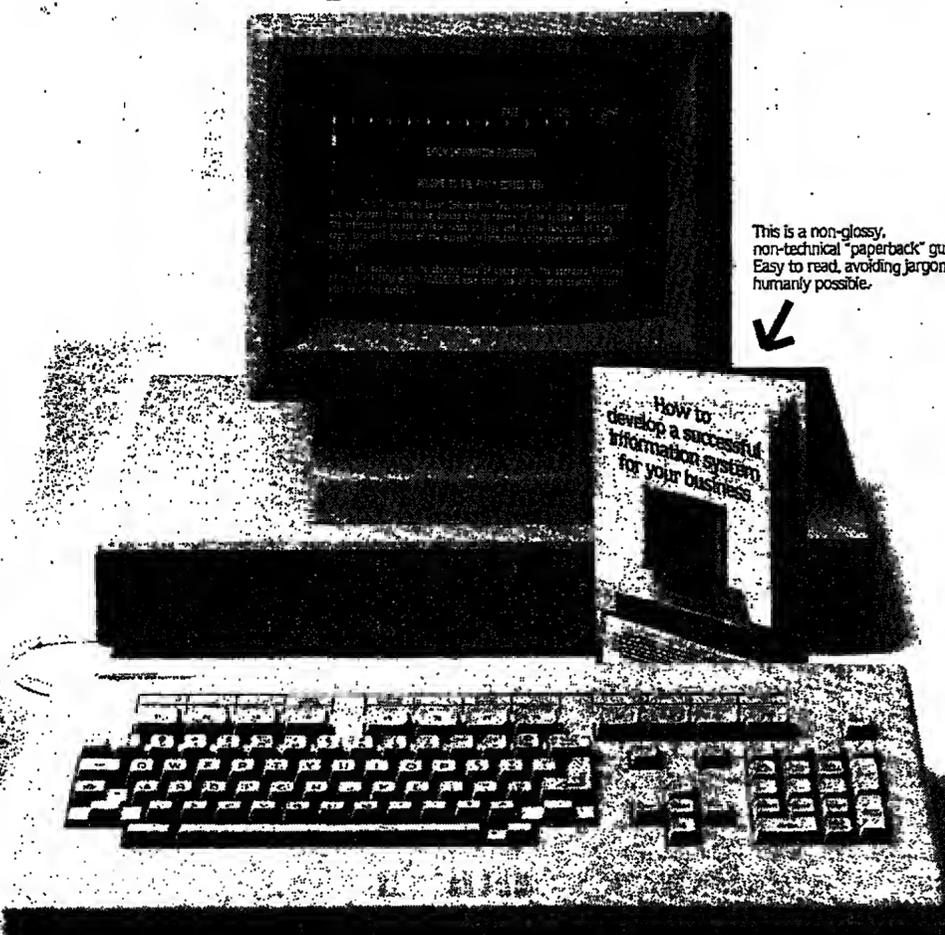
Sira Institute of Chislehurst, Kent (01-487 2636) points out that there has always been interest in equipment that will do this but that until recently, it has been either over-complex, expensive, or both.

Cost effective

However, in recent years, the necessary computer processing power for image analysis has been getting cheaper so that now, according to Sira, the problem has become one of selection of the most appropriate and cost effective system for the job.

So the Institute has launched a survey project centred on equipment selection, starting this month and due for completion within nine months. Participation costs £750 and more details can be obtained from John Claridge at Sira.

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Cutting salt mine problems

THIS £0.5m cutting machine—the only one of its type in the world—is at work at ICI Mond Division's salt mine at Winsford, Cheshire. Its main purpose is to eliminate roof rock falls. The 70-tonne, 7 metres wide, 7 metres high and 8 metres deep self-propelled gantry results from a marriage between a Goodman cutter, supplied by

Fletcher Sutcliffe and Wild and the gantry designed by Robert L. Priestley of the Edmund Nuttall Group, and manufactured by another member of the Edmund Nuttall Group, Williamson Engineering. The machine is a possible answer when mining engineers have to blast underground which can, obviously, shatter the roof rock and create safety problems.

In its operating position the gantry is hydraulically jacked between the roof and floor to provide a rigid platform for the cutter. This can be moved along a slide to cover the full 18 metres width of the face to a depth of 4.5 metres in four arcs. If you have a salt mine, Robert Priestley will be happy to advise you. Phone 01-750 8958.

“...apparently they're developing this word processor that can type ten memos at once and store them on a diskette the size of a half penny for automatic filing in your personal satellite and it even says 'Have a nice day' when you come into the office if you ask me. It makes your secretary obsolete, so seriously it takes about half an hour to type a letter but this machine will do it in 4.9 seconds and it will make you a cup of coffee at the touch of a button did you see Tomorrow's World last night? The wind tuggles at some of the things they're doing I mean there's this computer it's only the size of a portable TV but it'll communicate with your photocopier in fourteen languages it's absolutely incredible...”

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THE ARTS

Royal Academy

Permanent pleasures

by DAVID PIPER

While the main exhibition galleries at Burlington House, emptied of the splendours of Japan, are being made ready for who knows what splendours of the annual Summer exhibition next month, the Royal Academy stops a gap in its exhibition programme by showing a selection of its own permanent collection: the Royal Academy Retrospective. This (daily until May 23) is handsomely arranged in the Private Rooms. It contains many treasures which will seem familiar, yet which may in fact be better known from reproductions than from a sight of the original, for they are only rarely, in the pressure of the Academy's loan exhibition schedule, available in the public.

condition — the show offers much pure and unadulterated pleasure. Not only, for example, Constable's Diploma Work (The Boat Passing a Lock) but the exhilarating full-scale study for The Leaping Horse, and a whole set of those brilliant, small studies of English weather, snatched down out of the passing moist moment in oils on a sheet of paper, of which he was the unsurpassed master. No brownness, no dimness here. In one, the sky, burdened beyond bearing, tilts, and sheds in ragged sheets its water on the world. Gerald Manley Hopkins might have done it in verse, but rather later.



Science Is Measurement by Henry Seeley Marks, from the Royal Academy's permanent exhibition

is with Stanley Spencer's *Dustbin* of 1956: a tubular Spencer lady laying dead flowers to rest, about to slam down the corrugated iron lid with the clap of doom. An supreme masterpiece the Academy offers its great fonda by Michelangelo, the Madonna and Child with Infant St John, the Madonna conceived and brought to the brink of finish and there left in such tenderness as if the artist gave up the finishing in fear of spoiling it. But less well-known, the diploma work of that extraordinary, but still unrecruited sculptor, Thomas Banks: his *Falling Titan* of 1786 commands attention. The naked titan falls headlong in a collapse of huge rocks. The gigantic scale is suggested by a minute satyr and a goat incised on the base, and the whole piece expands in the imagination to a colossal scale as one looks. It could be a model for a monument as vast as St Paul.

Festival Hall

St. Matthew Passion

by DOMINIC GILL

It was tempting to try to sample all of the St. Matthew Passions — not less than four — being given around London last Good Friday evening; but musical sense prevailed over curiosity, and for no better reason than acoustical preference, my choice fell on the London Choral Society's performance with the English Chamber Orchestra under Nicholas Cleobury at the Festival Hall (if you are going for the music, St. Paul's Cathedral is the last place on earth, except possibly the Grand Canyon, in which to choose to hear Bach).

voice choir. Most indeed make a decent bow towards observing at least the spirit of Bach's basic requirements — although nothing can truly replace the proper arrangement of two widely separated choral groups, each accompanied by a chamber ensemble of no more than around 15 players actually using the instruments so meticulously prescribed by the composer. Nothing else adequately marks the antiphonies, which themselves spring from the dialogue nature of *Evangelium*, libretto and from which in turn spring much of the great dramatic force of the Passion; and nothing else captures the magic of the colour, texture and inner balance of the music, so meticulously imagined.

Any concert hall performance of this Passion, with choirs and instruments on stage facing the audience, must in some respects fundamentally compromise the composer's conception — and most especially the marvellous antiphonal effects of two choirs and orchestra, played by each Thomas's Church in Leipzig, each group with its own continuo and quartet of soloists, calling and answering from side to side.

well chosen to make unarguable points, but more of his own voice-over than one would have thought possible (mostly, I think, reading from his published "conversations" with Robert Craft). He was authentically present, then, and Palmer never weakened the effect by putting him in a tenorish context — say, by selecting Stravinsky bits to make evidence for some external thesis; he simply found the necessary background for us, often with splendid resourcefulness. There were ancient photos, interviews with old Russians and with the composer's children, playbills, other people's music. The only "opinions" on offer were solicited from friends and musicians who had a right to hold them.

Three hours of television about Igor Stravinsky could hardly be boring — I doubt that thirty hours about Stravinsky could be boring, so long as they stuck to facts (as Tony Palmer's film did) and spared no opinions; but three hours also gives epic scope for nit-picking, particularly by the superior Stravinskian who doubts that musical snippets with pictures can serve any honest purpose.

It is strange that music so self-contained and self-explanatory as Stravinsky's should also be so specifically connected with the funeral in Venice, was accompanied by Stravinsky — not only the music, in snippets

Television

Tony Palmer's Stravinsky

by DAVID MURRAY

What LWT's South Bank Show gave us, divided between Friday and Saturday evenings, was neither straight performances nor exercises in "musical appreciation." It was illuminated biography that cut happily back and forth between archive film of the composer and a wealth of visual footnotes and amplifications — quick, unerringly apposite and utterly disarming. The flow of images, from idyllic St Petersburg through Europe and America to the funeral in Venice, was accompanied by Stravinsky — not only the music, in snippets

Dominion

Fidelio

Weish National Opera's *Fidelio* in the production by Harry Kupfer of the Komische Oper in East Berlin, disliked by some (including Rodney Milnes on this page) who saw it last September in Cardiff, was given a London airing on Thursday. Kupfer, a prominent member of the post-Felsenstein generation of opera producers, is a potential master whether you like it or not. In spite of what feels like decades of exposure to studiously dreary German grey-and-black with white Brecht lighting (with in this case some Wieland Wagner chorus routines for the prisoners), I found the effect of the first act of this *Fidelio* utterly absorbing.

ally classical set with four free-standing pillars that happen to be posts supporting concentration-camp lighting. That we are on the edge of grotesque parody, even self-parody (Germans not infrequently parody their own behaviour — so do we) somehow lends more strength than weakness. The second act is a very mixed bag — I recall a similar decline in an earlier Kuffer *Fidelio*, already worn at the edges when it was shown at the Dresden Festival in 1978, where for an English visitor there was an incalculable factor in the Dresden public's stony-faced tension. The present treatment of Pizarro and Rocco is illuminating, but the set, with grey drapes flapping in the draught, won't do for a deep dungeon. The final debating tableau, with the motley elements of Michael Gelio's *ENO Damnation of Faust* squashed on to one small platform, is a mess.

Covent Garden

Cav & Pag by DAVID MURRAY

Zeffirelli productions, 1959 vintage, lovingly revived: a good opening. The sets have evocative qualities, and already a certain period flavour; the lighting makes the most of them, even against a cyclorama which seems not to have been touched since the premiere. There is an abundance of cunning, natural detail — the Sicilian village piazza of *Cav* has a believable life, and *Pag's* travelling players make themselves an *ad fresco* support when the action breaks fire. In *Pag* a trip of the mule tamblers is elevated to sub-principal status, bystanders so obviously interested as to constitute a distraction, or more precisely to remind us (while the sinners set on with the opera) that this is a production. But that is faithful to the spirit of *Pag*, which is in the first place a theatrical conceit, and the sinners make to face down their conviction.

sticated ingenuity of Leoncavallo's score. Better still, he has a most attractive face, an easy, unforced smile, and already a certain period flavour; the lighting makes the most of them, even against a cyclorama which seems not to have been touched since the premiere. There is an abundance of cunning, natural detail — the Sicilian village piazza of *Cav* has a believable life, and *Pag's* travelling players make themselves an *ad fresco* support when the action breaks fire. In *Pag* a trip of the mule tamblers is elevated to sub-principal status, bystanders so obviously interested as to constitute a distraction, or more precisely to remind us (while the sinners set on with the opera) that this is a production. But that is faithful to the spirit of *Pag*, which is in the first place a theatrical conceit, and the sinners make to face down their conviction.

On to 1984 with Menuhin

Yehudi Menuhin has accepted the invitation of the Royal Philharmonic Orchestra to become President — in succession to Malcolm Williamson — for an initial five-year period. Menuhin, who has had a particularly close association with the RPO since the days of its founder, Sir Thomas Beecham, undertakes his official function in his new capacity when he welcomes the orchestra's

for that fortune. However, what it did deprive me of was the company and brotherhood of belonging to and with a great orchestra in whatever capacity. Now, after more good luck than any single musician has a right to expect, I have received this honour.

Palace

Song and Dance

by MICHAEL COVENEY

Andrew Lloyd Webber's double bill is somewhat pompously subtitled "A Concert for the Theatre." In the first half *Mari* Webb sings "Tell Me On A Sunday," a song cycle about a girl from Mansfield Hill moving to Manhattan and through relationships with a producer, a younger man from Greenwich Village and a married Casanova. After the interval, Wayne Sleep and eight dancers lay about to pretty nebulous effect during a performance of Lloyd Webber's *Variations on the A-minor*. It is a very long time since I have sat through a more ostentatious, less theatrically coherent evening. The curtain rises on Harry Robinson's old-time ballad *Brang* was about to descend from the flies and kick up his heels. The

THEATRES

ALBANY, S. 036 2874. Credit cards 278 555-550 0731. Open Mon 8.30-10.30. Tues 8.30-10.30. Wed 8.30-10.30. Thurs 8.30-10.30. Fri 8.30-10.30. Sat 8.30-10.30. Sun 8.30-10.30. Ticket prices: £1.50, £2.50, £3.50, £4.50, £5.50, £6.50, £7.50, £8.50, £9.50, £10.50, £11.50, £12.50, £13.50, £14.50, £15.50, £16.50, £17.50, £18.50, £19.50, £20.50, £21.50, £22.50, £23.50, £24.50, £25.50, £26.50, £27.50, £28.50, £29.50, £30.50, £31.50, £32.50, £33.50, £34.50, £35.50, £36.50, £37.50, £38.50, £39.50, £40.50, £41.50, £42.50, £43.50, £44.50, £45.50, £46.50, £47.50, £48.50, £49.50, £50.50, £51.50, £52.50, £53.50, £54.50, £55.50, £56.50, £57.50, £58.50, £59.50, £60.50, £61.50, £62.50, £63.50, £64.50, £65.50, £66.50, £67.50, £68.50, £69.50, £70.50, £71.50, £72.50, £73.50, £74.50, £75.50, £76.50, £77.50, £78.50, £79.50, £80.50, £81.50, £82.50, £83.50, £84.50, £85.50, £86.50, £87.50, £88.50, £89.50, £90.50, £91.50, £92.50, £93.50, £94.50, £95.50, £96.50, £97.50, £98.50, £99.50, £100.50.

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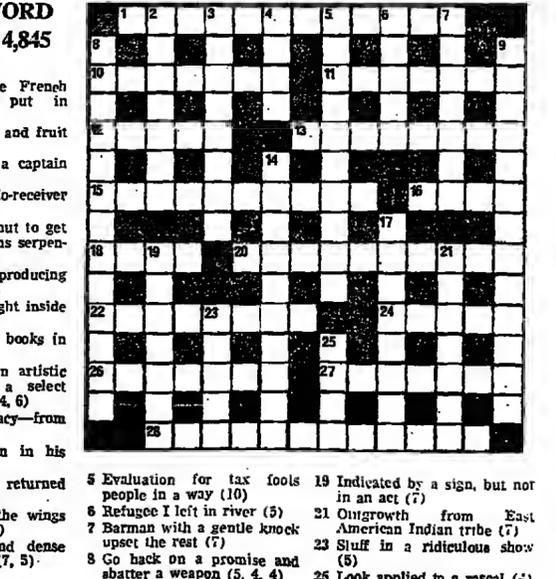
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F.T. CROSSWORD

PUZZLE No. 4,845

ACROSS

- 1 A secret gift—the French wine litre, put in pavilion (6, 6)
2 Got up with joint and fruit (4, 5)
3 Box according to a captain (7)
4 Approach an audio-receiver (5)
5 A call for help about to get the better of fibrous serpentine (8)
6 Begin with a plant producing nil for a spell (4, 6)
7 Lots of fish put right inside a tin (4)
8 Two Scandinavian books in redned Danish (4)
9 The chief trend in artistic development for a select division of pupils (4, 6)
10 An unexpected legacy—from fruit? (8)
11 Sincere Frenchman in his province (5)
12 Pedal part sailor returned (3, 4)
13 Duck, to confine the wings of, in judgment (7)
14 Unusually rich and dense type of porcelain (7, 5)
15 Severe south-wind with energy (7)
16 What an anaesthetist may do there, is converted by direction (8)
17 South American Indian I put up (4)
18 Indicated by a sign, but not in an act (7)
19 Outgrowth from East American Indian tribe (7)
20 Stuff in a ridiculous show (5)
21 Look applied to a rascal (4, 5)
22 Evaluation for tax fools people in a way (10)
23 Refugee I left in river (5)
24 Barman with a gentle knock upset the rest (7)
25 Go back on a promise and abatter a weapon (5, 4, 4)
26 Doctor in an exhibition right now (7, 6)
27 Unusual pose called for the edge to be cut into curves (10)
28 Pre-eminent swimmer, a member of the Asteroides (8)



The solution in last Saturday's prize puzzle will be published with names of winners next Saturday.

FINANCIAL TIMES

BRACKEN HOUSE, CANNON STREET, LONDON EC4A 4BY
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Tuesday April 13 1982

Diplomacy to the rescue

SO FAR, so good. The extraordinary shuttle diplomacy being conducted by Mr Alexander Haig, the U.S. Secretary of State, between London and Buenos Aires seems to be working—at least to the point that there is now a greater awareness in both Britain and Argentina of the need for a negotiated settlement of the Falklands dispute.

Realisation

The main point, however, is that with the aid of the U.S. tempers seemed to have cooled. It is entirely possible that the U.S. which has more than a foot in both camps—Europe and Latin America, should have behaved in such a fashion. It is a long time since a superpower has shown such responsibility in seeking a peaceful solution to an international dispute.

At the start, there were two nationalisms: Britain's and Argentina's. The danger was that they would feed on each other to the point where armed confrontation became unavoidable. Yet now the realisation seems to have dawned that the dispute is a complicated one—not just the result of naked aggression, though the Argentinian invasion was certainly that, but also the product of a longstanding historical anomaly.

Durable

The Falkland Islands were, indeed, British. But it had been clear for some considerable time that Britain lacked the ability to defend them against a power with counterclaims, however dubious, and which was in any case so much nearer: hence the efforts of the Foreign Office over the years to reach a diplomatic solution before the debate occurred.

If the British were to reoccupy the islands tomorrow, the

problem would remain the same. At some stage, the Royal Navy would have to return to more familiar waters and the Argentinian claim could be revived. It is the merit of the international diplomacy now going on that attention is being focussed on a more durable settlement. The Security Council at the United Nations has been used to good effect. Resolution 502 did condemn the invasion and called unequivocally for withdrawal. The Argentinian regime appears at least to have taken note, as well as to be heeding the entreaties of Mr Haig. And, in truth, the regime must know as well as anyone else that there are all sorts of other sanctions that could be thrown at it. The country's economy is in too parlous a state for it to risk total international isolation.

Yet if Argentina seems to have backed down slightly, in time there appears also to be some movement from Britain. It is no use seeking to return to square one and staying there. The status quo ante has been shown to be untenable. The British are right to go on pressing for an Argentinian withdrawal, as the Security Council Resolution demands. But they would also be wise to start discussing ideas of trusteeship, shared sovereignty or any other variant with Mr Haig, the Organisation of American States or any relevant body.

Parliament

The decision to recall Parliament this week is correct, if only so that Members can be given an account of the state of play which is substantially different from the end of last week when it went into recess. It was notable even then that the mood of MPs was markedly less hostile than in the first emergency debate on the Falklands on Saturday, April 3. We would hope that it will now have cooled down even further. Any right-wing Tory MPs who resent the American intervention should be firmly squashed by the Prime Minister. What has happened is that diplomacy is being given a chance. That is much better than the shooting war which, though it still cannot be ruled out, looks rather less likely than a few days ago.

Reviving the inner cities

THE ROOTS of the social and economic problems in Britain's inner cities stretch back 80 or more years; it is unrealistic to expect them to be solved overnight or even within the lifetime of one Government.

That could be no justification either for doing nothing or for continuing unchallenged the pattern of previous years, which has mainly involved throwing large amounts of public money at the problem without achieving any noticeable halt to the decline. If there were ever any doubts about that, last year's urban riots dispelled them once and for all as Lord Scarman's unambiguous report later underlined.

Although the Cabinet was shaken by last year's events Mr Michael Heseltine, Environment Secretary, seemed to be the only minister to perceive the extent of the problem and the long-term dangers it posed. The issue became his over-riding concern, replacing both the complexities of local government finance and the challenge of trying to introduce modern management techniques into his enormous department.

Improvement

So now, a year later, it is not surprising that while the Cabinet collectively has no answer to the charge that not much has happened Mr Heseltine individually can claim that he has sown a number of seeds which should provide some long-term improvement.

The main initiative, announced last week, is a scheme of urban development action grants (UDAG) inspired by, and closely modelled on, the U.S. system. It will, as guaranteed in a vital paragraph buried in the Budget statement, provide £70m of new money in the first year for projects within the 43 most deprived urban areas. But it will no longer be money freely handed out to be poured into more public-sector schemes.

The money will be available only for local authority schemes which have already attracted a commitment of substantial funding from the private sector. This makes the UDAG funds "persuasion" cash—money which might tip a commercially unviable project into viability or might provide enough of a boost through a soft loan,

interest rate subsidy or guarantee to persuade a company to become involved in an area which it would not otherwise contemplate.

This initiative, which is a radical move away from traditional British approaches, is welcome. All credit for it goes to Mr Heseltine's Financial Institutions Group (FIG), his 25 managers on secondment for one year from leading banks, companies and institutions.

Answers

This is only the first of a number of FIG initiatives in the pipeline. The group has been working industriously, knowing how heavily the nation was relying on it to find new answers to intransigent problems. More proposals on housing, small firms, development and the active involvement of institutions in inner city projects are awaited.

But a number of potentially serious difficulties appear to be looming.

A major objective of FIG's creation was to examine closely and critically the role of the institutions themselves and to try to find ways of involving them in tackling a national problem. But there are signs that some institutions, having seconded members of their staff to FIG, are reluctant to involve themselves more directly in the inner cities and are even resisting some of the FIG proposals.

Another possible difficulty is the attitude of local authorities. The Government wants bids for UDAG money by September so the grants can roll into cash flow at the beginning of the financial year next April. This means councils must start talking to the private sector and preparing schemes immediately.

Urgency

The slow response to a similar scheme for derelict land grants—another form of UDAG—and the remarkable level of under-spending on the local authority capital account in 1981-82 indicate that councils are not always able to act quickly on capital schemes. Mr Heseltine and FIG are playing their part to the full. It is now up to the institutions and local councils to respond with the same sense of urgency.

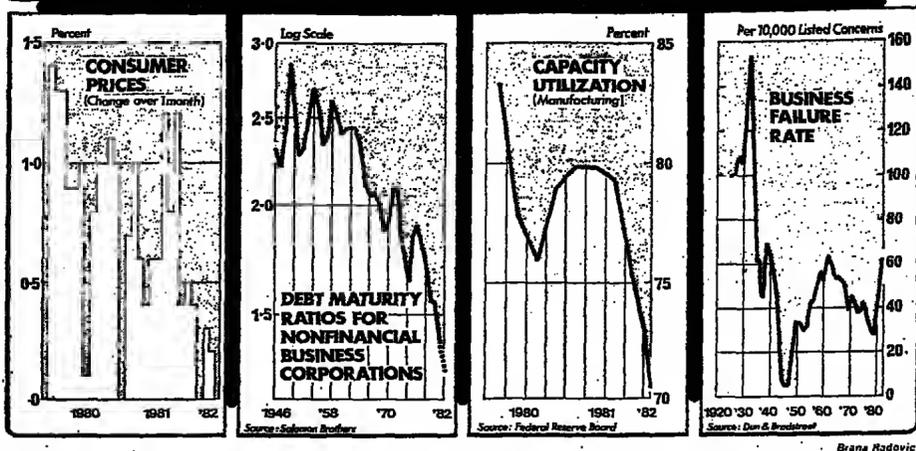
U.S. BUSINESS CLIMATE

FIRST IMPRESSIONS are often dangerous. But after a few weeks in the U.S., it is difficult to ignore a feeling of deep foreboding within the business and financial community.

This stems from the fact that the present business cycle is unlike its predecessors in two obvious respects. The first is that despite the low level of economic activity, real interest rates stand close to their post-war peaks. At a time when the underlying rate of inflation is running at about 7 per cent a year and falling, the prime rate stands at 16.5 per cent and long dated Treasury bonds are yielding over 13.5 per cent.

The second big difference is that the corporate sector is in a frail condition to cope with a tight squeeze on profits and cash flow. By almost any yardstick you care to use, a prolonged period of deterioration has left companies' key balance sheet ratios in a worse shape than at any time since the war. Such a combination is deeply unsettling for U.S. businessmen, and seems to be overriding the one unequivocally good piece of economic news in recent months—the sharp slowdown in the rate of inflation. Net finance costs are gobbling up about one sixth of the company sector's pre-interest profits at a time when selling prices are coming under increasing pressure. The result has been a sharp increase in the rate of business failures to the highest level in 20 years. During a period of rapid price

THE WARNING SIGNALS



defence spending is rising sharply, and there is a tax cut coming on July 1 to help stir consumers into action. In a traditional cycle this is just the point when credit conditions should be at their slackest and, with an upswing in business activity and profits in view, share prices should be surging.

But look around. A mortgage costs you 16 or 17 per cent at a time when house prices—at best—are not rising. Half a dozen important companies in several different sectors of the economy are in dire financial difficulties, and no-one would be surprised to see a few major bankruptcies in the near future.

The farming sector is flat on its back, with the purchasing power of farmers down to the lowest point since the 1930s. The savings industry is in a state of turmoil: the savings and loan associations, which are mainly involved in making residential mortgages, are currently losing money at an annual rate of \$60m, which is equal to about one fifth of their combined net worth.

Far from taking an increasingly hopeful view of profits, Wall Street is busy revising its forecasts downwards. Lynch, Jones and Ryan, a broking firm which tracks the work of about 60 brokerage houses, says that more analysts marked their forecasts down in March than at any time in recent years—and their figures may still be too high. On average, brokers continue to project a modest rise in overall earnings this year—which seems improbable after what is likely to have been a grisly first quarter. Tentative forecasts for 1983 imply a profits rise of nearly one fifth next year, which also looks a bit hopeful.

A good old fashioned business update looks increasingly unlikely. A feature of the last few weeks has been the number of large companies—such

as Dow, Caterpillar, or Weyerhaeuser—which have announced plans to scale down their capital spending in a big way. The Department of Commerce's quarterly survey has already shown a sharp fall in the rate of capital spending planned this year compared with earlier expectations. The backlog of orders in the machine tool industry has fallen by nearly 30 per cent in the space of six months.

For similar reasons, manufacturers are unlikely to start rebuilding their inventories to

any great extent in the present climate. When money is expensive and input prices are falling, stockbuilding makes no sense.

The latest survey by the National Association of Purchasing Management shows that the proportion of members reporting falling prices is the highest for 30 years. And the number which are only prepared to commit themselves to buying more than 30 days forward has also risen sharply, in this case to a nine-year high.

As a result, no one now seems to expect anything but an

anaemic recovery in the economy during the latter part of this year. The kind of numbers you hear most frequently on Wall Street indicate a fall of about 4.5 per cent in the first quarter of 1982. That might be followed by a very modest rise in the second quarter as destocking runs its course, and by a gain of maybe 4 or 5 per cent in the second half of the year.

The real worry is about 1983. Without a worthwhile fall in real interest rates, there seems every chance that recovery will splutter out and die in the early part of next year. So why are interest rates so high? The stock answer is that the Administration's monetary and fiscal policies are in direct conflict with one another—the one restrictive and the other expansive. The result is a high degree of uncertainty about the financial outlook over the medium to long term, which in turn has been reflected in the cost of short term money.

The continued demand for credit by companies which must reflect at least partly the squeeze on their cash flows has surprised many forecasters. And with the long term bond market more or less closed down in current conditions, this demand for money has been heavily concentrated at the short end of the market. Predictably enough, Wall Street hopes that the present policy conflict will be resolved by a tightening on the fiscal side.

Indeed there are those who argue that a more accommodating monetary stance by the Federal Reserve Board would actually push up interest rates, since it would be taken to signal the end of the fight against inflation.

The subject to which all conversations return at the moment is the need for a radical overhaul in the Administration's budget strategy—and

soon. The hawks say they will only be satisfied with a "two-digit deficit"—less than \$100bn—in 1983, which could mean shaving the present number by \$50bn or more.

Others argue, probably more realistically, that what is needed above all is a change in direction—a credible set of numbers that would point to steadily falling budget deficits in the years to come.

As things stand, estimates seem to rise by a few billion almost every other day and there is an uncomfortable feeling that fiscal policy might be slipping out of control.

Some form of budget compromise will presumably be worked out in the quiete near future. In an election year, the shape it takes will depend on how far the pain of reducing planned spending programmes, or increasing taxes is seen to be outweighed by the need to do something about the crippling cost of money.

There is certainly a sense of urgency in the air. Some industrialists and bankers go as far as to suggest that irreversible damage will be done to the corporate sector if interest rates are not brought down to the next couple of months.

That sounds too cataclysmic. What strikes the European visitor, perhaps above everything else, is the sheer size and spread of the U.S. economy. Problems that might appear devastating at home can be absorbed here without too much damage.

However, political decisions in the next few months seem bound to have major repercussions on the outlook for

economic growth in 1983 and beyond. And until they are taken, the financial and business picture will remain cloudy. In the securities markets, some of the boldest souls are beginning to talk with more confidence about the case for long-dated bonds—which would be overwhelming if it was clear that present trends in inflation could be sustained.

But there is still a great deal of uncertainty in the equity market. Shares yield about 6 or 7 per cent; way below the going rate on bonds. And given the present outlook for profits and the poor financial condition of so many companies, the scope for dividend growth over the next year or two may not be all that great. Indeed, more companies passed their dividends altogether last month than at any stage in the last seven years; and April has kicked off with the mighty Ford Motor Company announcing no payment to shareholders for the second quarter in a row.

As one veteran of half a dozen business cycles put it last week: "We all know that the time to buy is when the gloom gets real thick. The trouble is that this time the gloom is real thick."

Large companies plan to scale down capital spending

Inflation, it made sense for companies to borrow heavily. It seemed a painless way to increase the return on shareholders' funds, since the falling value of the dollar meant that the real cost of the loans was negligible. So it was that in the six years to the end of 1981, the total debt of non-financial companies in the U.S. roughly doubled, while the proportion of short-term liabilities rose sharply.

But now the position has changed with a vengeance—which helps to explain a view widely held on Wall Street that movements in the cost of money during the next few months could have a critical impact on the long-term future of wide swathes of manufacturing industry. If these were ordinary times, it would be reasonable to argue that the tide of recession was now lapping somewhere around the low-water mark—with scope for a marked upward surge in the second half of this year. After a three-year slide, the number of housing starts seems at last to have hit rock bottom. Motor car sales will look dreadful on year-to-year comparisons, but have shown more stability in recent months. The level of

the farming sector is flat on its back, with the purchasing power of farmers down to the lowest point since the 1930s. The savings industry is in a state of turmoil: the savings and loan associations, which are mainly involved in making residential mortgages, are currently losing money at an annual rate of \$60m, which is equal to about one fifth of their combined net worth.

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What they're saying

"By all the rules of the game, interest rates should be down around 9 or 10 per cent."

—President Reagan

"I consider the proposed budget to be not a blueprint for recovery but a recipe for even greater disruption in our economy and financial markets."

—John McGillicuddy, chairman, Manufacturers Hanover

"My instincts tell me there will be one or two large corporate failures."

—Malcolm Baldrige, Commerce Secretary

"If the Fed does anything different from what it is now doing, it will abort what we're now engaged in. If it prints more money the rates are going to go up; if it tightens up, the rates are going to go up."

—Walter Wriston, chairman, Citicorp

"There is only limited time left. It is a difficult task, to say the least, but delaying will be dangerous in terms of financial uncertainty and economic uncertainty."

—Dr Henry Kaufman, Salomon Brothers, on the need to cut the budget deficit

Men & Matters

Air power

Why has the mighty Rascal-Decca taken the trouble over the Easter weekend to take expensive Press advertising to promote an obscure piece of hardware, namely a new navigational device for yachtsmen?

The answer lies in a dispute between the two European electronics giants Philips and Rascal-Decca. They are provoking each other by action and counter-action—and in Rascal-Decca's case by added threats of resorting to the law.

The rumpus is over the use of radio transmissions which can tell yachtsmen and fishermen at sea exactly where they are whatever the weather. Since taking over Decca, the Rascal-Decca group handles the Decca Navigator system which has been popular with commercial shipping for 35 years.

Decca made it a money-spinner by a strict policy of refusing to sell the receivers. They have been available only through rental arrangements for about £1,000 a year apiece.

Now, however, an abrupt change in policy has occurred at Rascal-Decca. It has rushed to the market its own small receiver for yachts and fishing boats which will be sold outright for £1,500. It will be surprising if a number of commercial ship-owners do not also take advantage of the new set in preference to continuing their rental arrangements.

Rascal-Decca is not changing a successful policy on a whim. It is thought to be reacting quickly to a threat from the rival company Philips. The long Decca monopoly has been upset by Philips having one of its subsidiaries in Copenhagen make and sell what is called the AE Navigator. That little gadget, the size of a couple of shoeboxes, spells out latitude and longitude. And how does it do it? Why, it listens in to the Rascal-Decca stations.

Chain reaction

The Forester chainsaw attachment—it can convert the dead elm lying round your estate into planks—was reported on the FT's Technology Page on March 23.

Two days later Mr Visram, managing director of the manufacturers' phoned the FT. "Help," he said. "Our switchboard can't cope."

"Neither can we," said the FT switchboard, the FT library, and the Tech Page secretary, as reader's inquiries rolled in.

Mr Visram phoned again. "I'm getting calls from Madrid, Canada, Finland, Sweden and Norway." "How do you do it?" "A trade secret" said the Tech Page people.

They tell me that one item printed last October resulted in sufficient orders to keep a small company going until next August.

Wham

During the Falklands emergency a special Cabinet committee responsible for maintaining national wit, humour, and morale (WHAM) is looking for support. I will provide an extra chuckle ration for this one day only.

The Birmingham Chamber of Industry and Commerce is advertising a seminar on Export Opportunities in Argentina. "Methods of entering the market" will be explained by amphibious assault craft, I suppose.

From Dublin comes the tale of the man who told his parish priest that in six weeks he had lost £1,000 on the horses. "Every day I went to St Patrick's church and prayed for guidance," he said, "but still I lost." "St Patrick's?" said the priest. "You fool! That's the one for flat races."

In a City cafe: "I know she's got three good A-levels, Angela, but I think Mr Willis took her on because of her two good eye-levels."



"Just keep away from TV, radio and newspapers for a few days—you've got a bad case of Jingoism."

Rascal-Decca cannot sue all users of its air waves because some of the transmitters sited in Europe are under the control of host governments. But the group does intend to take legal action against anyone using what it calls "unauthorised equipment" to pick up its radio transmissions inside British territorial waters.

Still together

Officials of the Irish Justice department have been having a legislative spring clean. And among the flotsam and jetsam which has turned up is, surprisingly, the Act of Union of 1800 which merged the then kingdoms of Great Britain and Ireland.

It seems that in spite of Irish independence in 1922, and the declaration of a republic in 1949, nobody has actually got round to formally abolishing the union.

Cool Harvard

They are turning down the heat at the Harvard Business School. The number of hours spent in class by first-year students is to be cut by about 15 per cent and the workload of second-year students will also be pared.

The school says that pressure of work has built up in recent years to a point where it has begun to affect the quality of students' output. More to the point perhaps, it has also bitten

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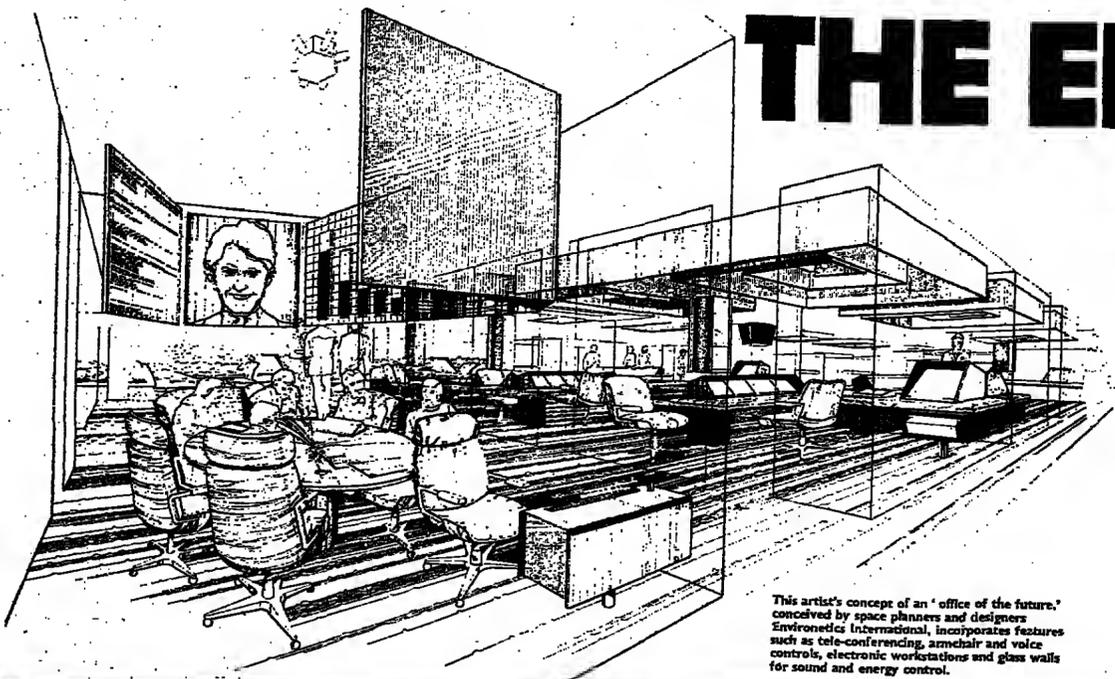
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FINANCIAL TIMES SURVEY

Tuesday April 13 1982

THE ELECTRONIC OFFICE

The shape of things to come



This artist's concept of an 'office of the future,' conceived by space planners and designers Environetics International, incorporates features such as tele-conferencing, armchair and voice controls, electronic workstations and glass walls for sound and energy control.

By Alan Cane

THE "electronic offices" of today and tomorrow have a distinguished ancestry. Britain's very first commercial computer, an imaginative venture between J. Lyons, the food and catering chain, and Cambridge University, was known by the acronym LEO—for Lyons Electronic Office.

The first LEO went into service in 1953 and was used internally by Lyons for accounting and payroll preparation. The last one, used by British Telecom for data processing work, was taken out of service only 12 months ago. And a senior Telecom executive added in praise: "They had a lot going for them that modern computers don't have. You felt you were really in control."

Now, J. Lyons has a Corner House back in the Strand, complete with nippies, and the electronic office is again in vogue, although using equipment and on such a scale that the LEO pioneers could never have envisaged.

LEO was a data processing computer—it was described as an electronic office because the work it did used to be carried out in offices before financial and political constraints banished the computer to its own ivory tower, the computer centre, complete with its own attendants, the data processing department.

The present frenetic enthusiasm for electronic office systems is simply the latest stage in the gradual redistribution of computing power out from the computing centre to the operating divisions of an organisation.

Frenetic enthusiasm? To be honest, most of the enthusiasm is to be found among manufacturers and suppliers, while their customers watch carefully, but in the main, refuse to commit themselves.

Nevertheless, the pace is quickening. In a study of Office Automation in the UK undertaken by the consultancy Urwick Nexos, some 67 per-

cent of the organisations questioned said their budget for automation would increase in real terms over the next 12 months.

Moreover, some 23 per cent of managers in those companies said they had hired someone in the past 12 months purely to work on office automation. And the technical qualifications of these new office specialists seemed to lean more towards word processing and communications than conventional data processing.

The coming of office automation seems, in fact, to be creating a new kind of office hierarchy. There is a growing realisation especially in the larger companies that there is a new unity about many of the traditionally distinct office services. With the coming of word processing and electronic mail, for example, it becomes less easy to see a distinction between typewriting services, mail services and telecommunications.

The trend, first identified by Mr Roulad Yearley of the BIS group, is to the establishment of a new corporate post, that of systems overlord with a number of line managers looking after word processing, data processing, mail services, telecommunications and printing reporting to him.

What sort of systems will this new species of corporate animal have in his charge? It is very difficult to predict exactly what

the office of the future will look like, despite the number of suppliers with offerings in this area. GEC is only the latest in a series of companies, large and small, that have announced their vision of the electronic office in the past two years.

Xerox is perhaps the most interesting because more than any other company it has tried to establish a standard for the best way to connect different pieces of office equipment—word processors, printers and memory units, for example, in the office. Last year, it announced both EtherNet, its local area network product, and the Star workstation, an advanced terminal for executives.

Xerox has been working on these products, and others that interface to them, for the past 10 years.

Wang, a U.S. company which, through a mixture of sound electronics and imaginative marketing, has had dramatic success in word processing, launched new and advanced products which promise the fast and efficient distribution of text, image and voice.

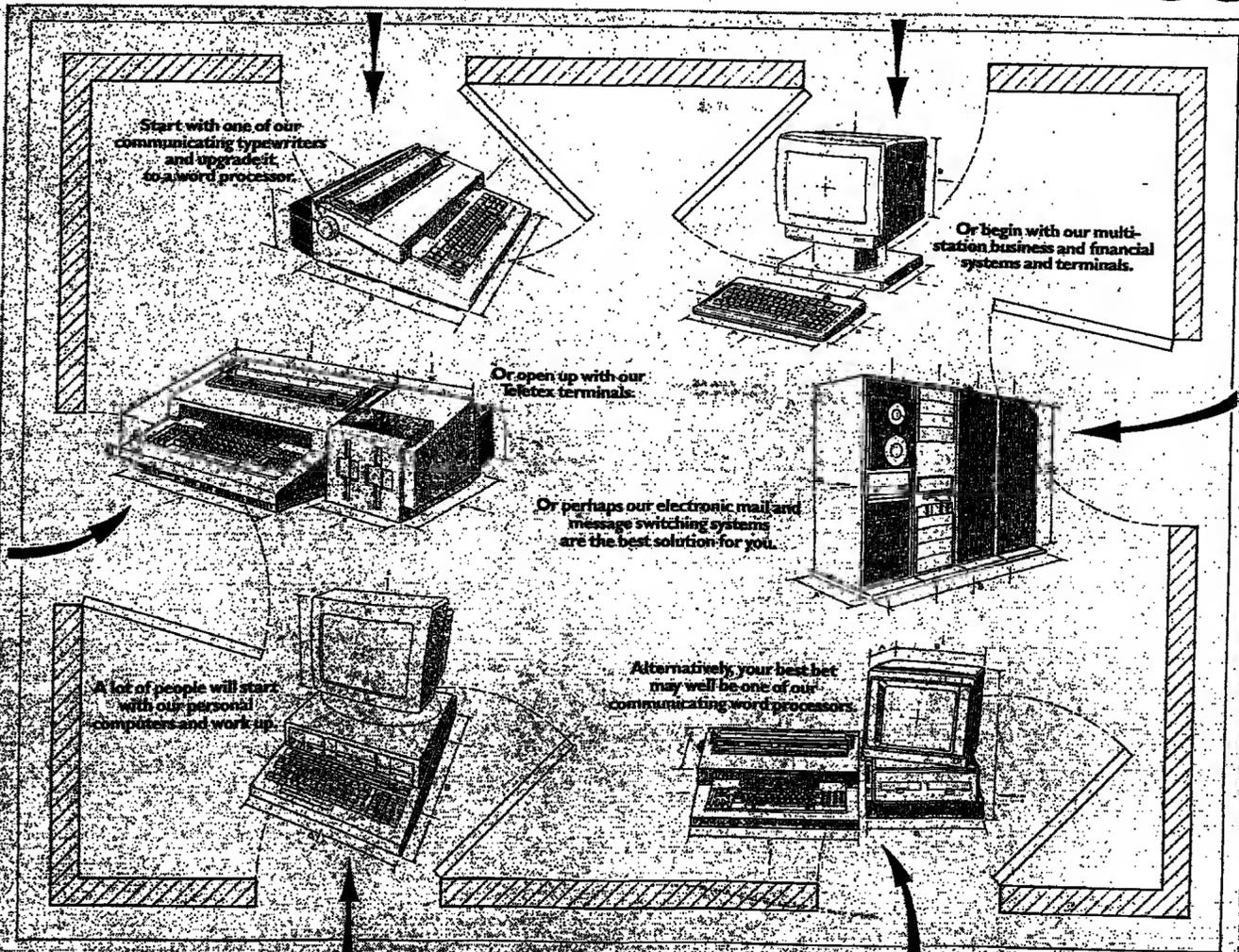
Burroughs launched "Offis 1," a collection of office products, Data General released new software and improved terminals for the office, Office Technology launched a system which enabled its customers to attach voice "notes" to typewritten text. ICL and Sinclair announced they would work together to produce a tiny telephone terminal with a display based on Sinclair's flat screen technology.

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● Editorial production of this Survey was by Mike Wiltshire and Arthur Dawson. Design by Philip Hunt.

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THE ELECTRONIC OFFICE II

All sizes of computer will have a role to play in the office of the future

When the right mix is important



In this office information system, the Burroughs OFIS-1, the components are engineered to fit the individual needs of managerial and clerical departments

IT IS unlikely that any office of the future can avoid using the computer in whatever guise, in some aspect of its operations.

The British Government's Technology 82 Committee cites the importance of computers in its description of office automation which is "the use of computers, microelectronics and telecommunications to help us store, obtain and send information in the form of pictures, words and numbers more reliably, quickly and economically."

When computers were moved into offices in the 1960s, companies opted for large and fast systems because to justify the cost of such computers they had to be used for processing information in large quantities as quickly as possible.

This precluded their use in all but the largest organisations. Since then, the development of minicomputers and microcomputers has given offices relatively low cost but extremely powerful computer tools which can sit on an office desk, rather than have to be enclosed in air-conditioned sanctuaries.

As Alan Cane points out in the introduction to his survey, one of the first applications of the computer to the office was developed by Lyons, the company fondly remembered for its corner teashops around London. Lyons produced its "Leo" (for Lyons Electronic Office) computer system in the first half of the 1950s. This was used to take in daily orders from the teashops to provide better stock control of food and speed up delivery services.

Since the beginning of the 1970s, there has been a trend away from large computers like Leo in favour of distributed systems which put more computing power in the band of the user at his desk rather than concentrated through a central system.

The cost of providing such power has fallen with the decreasing cost of microelectronics which has also been coupled

with the shrinking size of computing systems but increased sophistication.

There is a debate at the moment as to whether it is the computer or the electronic telephone exchange which will be the heart of the electronic office. Telecommunications companies argue that it will be the exchange which is the core because it provides the link between equipment, while computer companies say the computer is the central unit because it will co-ordinate the activities of the electronic office.

On the other hand, some companies believe that neither the exchange or the main computer is necessary and bits of electronic equipment can be connected together by a local area network.

Aid for managers

This means that managers can have small personal computers sitting on their desks to help them with their planning and calculations. When they want to transmit the results of their work to someone else they simply send it down the network which connects all other small computers and office equipment together.

Companies such as Xerox has opted for this network approach while Xionics a small successful British company has chosen a computer controlled network. In its approach to the electronic office, Britain's ICL illustrates that it is possible to combine approaches. Traditionally a company which has produced larger office computers, it now also offers small computers for managers' desks and word processors plus a host of networkable office products including voice and text handling equipment.

For example, large companies may have engineering laboratories where it needs a small computer terminal capable of stand alone operation but backed by a larger computer data processing centres where large mainframe computers are employed, and regional offices

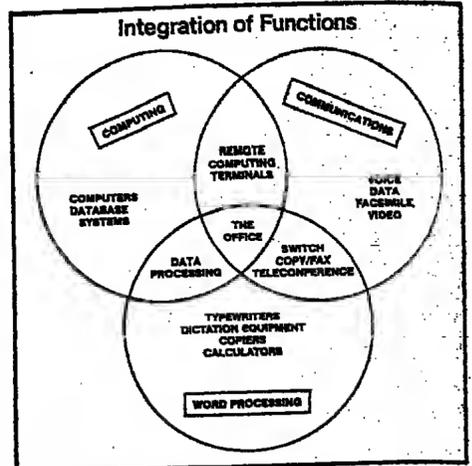
which require medium sized computers for routine office work.

It is likely that the large mainframe computers will have a new role in managing and monitoring these large networks. For many years, some industry observers felt that really large computer systems would become obsolete in all but research and defence applications because of the growth of the powerful small computing systems.

Developments at IBM tend to back up the concept that these large systems still have growth potential. Last year, IBM announced a computer based system designed to record, store and forward vocal messages which could have an influence on the development of electronic office systems.

IBM's system turns the human voice into binary digits, the language of computers, and records them on magnetic memory disc.

It has been possible for some time to store and forward data messages through data and messages systems, but voice storage requires much more complicated and more powerful computing systems to handle it. A device which could allow the user to dictate into a microphone and obtain an instantaneous typed transcription. George Orwell in his book



"1984" called it Speakwrite. IBM researchers have already achieved some success in this field but have to use a very large computer indeed to achieve any accuracy in transcription. In conclusion, then it must be assumed that all sizes of computers will have a role in

the office of the future whether it sits on a desk to provide personal files, message storage or diaries, controls the flow of information through the office or handles and manipulates large amounts of information for payrolls and accounts.

Elaine Williams

Fears that the machines might cut down jobs have now gone

Word processors break down the barriers

WHEN WORD processors first came onto the market, secretaries and typists tended to regard the machines in the way the Luddites regarded the steam engine — as a major threat to their livelihood.

However, the fears of mass unemployment through office automation has been largely unfounded. Word processors are rapidly gaining acceptance as a tool which can remove a considerable amount of office drudgery by carrying out boring, repetitive tasks.

In fact word processors are likely to be one of the most active areas within the electronic office equipment market, with an average growth rate of more than 20 per cent a year forecast over the next five years.

These systems, which are in essence, sophisticated electronic typewriters, are generally considered to be the route along which companies will make the transition to the complete electronic office, thus reducing the amount of papers shuffled within companies' walls.

There are more than 100 different models of word processors on the market. This figure excludes the software packages sold by computer companies which enables microcomputers, and larger computer systems, to have the extra facility of word processing.

Wide range

Those competing in the market range from office equipment specialists such as Lanier, Dyanhone and Rank Xerox to electronic equipment companies such as AES, Wordlex and AM Jacquard and software and computer companies such as ICL, Logica, Wane and large multinationals such as IBM, and Philips.

Though the market is dominated by U.S. companies in 1981 they accounted for about 50 per cent of sales. British companies seem to have fared better than most European manufacturers by gaining a greater hold in this competitive sector.

So far, the UK companies such as Logica have been able to match and even achieve superiority in terms of technical sophistication and low cost than some U.S. companies.

Because of the problems of turning the Japanese language into digital signals for displaying on a television screen, Japan has not made great inroads into the word processing market yet. But the potential of the market is too large for the Japanese to be deterred by such a barrier, and they are likely to be a formidable force in future.

When word processors were first introduced to the market, there were fears that they would cause large-scale unemployment in the office because of the greater productivity manufacturers claimed for their goods. Experience has shown that this is not necessarily the case.

Such systems come into their own in that the skills of secretaries and typists can be used more productively, containing the rising costs of preparing reports and business correspondence.

Savings in time and costs can be significant since many lengthy documents have to struggle through several stages of alteration, correction and retyping before they are ready for distribution. Word processors really come into their own where a large

number of similar letters or reports are produced. Computer type memory storage facilities available on many machines mean that hundreds of personalised letters can be produced at very high speed.

Such equipment can either be used singly as a direct replacement for a conventional typewriter or connected into a network to allow communications between machines to provide new services such as electronic mail and common information services.

The demand for communicating word processors is likely to increase as the cost of such units falls. The growth of this concept is hampered by the fact that it is still difficult for one manufacturer's word processor to talk to a rival machine.

Electronic mail systems, when tied into a word processor network, become particularly attractive to companies when office sites are already linked by leased telecommunications lines for voice, message or data systems. Many large companies operate such systems. Out of office hours, when such expensive lines usually lie idle, they could be used to transmit intra-company mail at little extra cost and save on conventional mail bills between offices.

Many office equipment companies believe the way to attract companies towards the complete electronic office will come from attacking the market at the bottom end. This is by encouraging the low volume user into buying slightly more sophisticated electronic typewriters as a first step towards full word processing.

These machines usually have one line displays plus a measure of word storage in the form of solid state memory display. Progressing further up market are the so called thin window units which have improved displays showing several lines of text plus a larger word store usually in the form of disc.

The full-screen based word processors are really intended for applications where a con-

siderable amount of editing or layout revision is needed. Typically such machines display from 24 to 63 lines of text, each line comprising between 80 and 96 characters with facilities for horizontal and vertical scrolling — moving the text up or down as in film credits or from side to side.

Over the past year or so prices of word processors have fallen dramatically. A business based machine, now costs around £1,000 and manufacturing is still dominated by the U.S.

Typing pools

Besides the stand-alone word processors are the shared logic systems. Essentially these are word processors which can operate individually but share a common memory computer system. This is for use in such places as large typing pools where work needs to be delegated to individual machines and progress monitored.

The cost of such a system prohibits their application in all but the largest organisations. For example, Wordplex has sold several of its smaller shared logic systems to Marks and Spencer, London. Electricity Board and several building societies.

At Marks and Spencer, the system is mainly concerned with preparing and up-dating specification projects and manuals for the company's computer department which prepares 15,000 pages of text a year.

With so many companies in the market and the recession affecting capital equipment expenditure, it seems likely that the downward price trend will continue. Some of the less competitive companies will drop out of the market through sheer weight of competitive numbers.

A number of users tend to rent machines rather than buy outright, simply because they are not sure if they have chosen the right machine or that it will fit into the present or future planned office organisation.

E. W.

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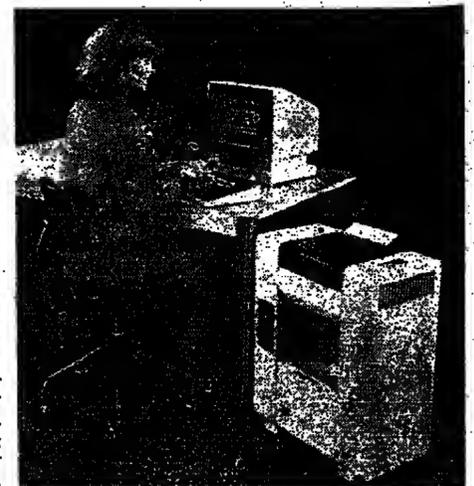
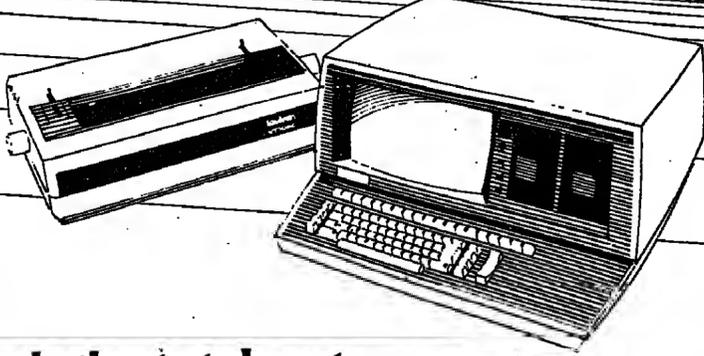
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The keyboard and display screen of the multi-function Wangwriter word-processing system (above) are moveable and the printer is quiet and compact. The Wangwriter's document-handling capability has been extended from 15 to 75 pages of text

THE ELECTRONIC OFFICE III

Guy de Jonquieres looks at the revolution in business communications

Era of profound change now under way

FOR MOST of this century, voice has been the dominant form of long-distance communication for business and residential subscribers alike. In most parts of the world, telephone communications have been provided by monopolistic organisations, enjoying total or virtual monopoly powers, whose principal objective has been to offer a uniform standard of basic service to as large a proportion of the population as possible.

This state of affairs is starting to change rapidly. Spurred by the growth of computer networks, demand for data communications is now outstripping the increase of "plain old telephone service." And the structure of the telecommunications industry is itself undergoing a major upheaval, as previously entrenched empires are confronted by new competition. For example:

● In the U.S., American Telephone and Telegraph reached an anti-trust settlement with the Justice Department earlier this year requiring it to dispose of its 22 local telephone operating affiliates. This means that AT and T will have to compete on more nearly equal terms with the smaller companies which have been chipping away at its long-distance business over the past decade.

In exchange, AT and T has been freed of previous restrictions on its entry into the booming market for "enhanced" or "value added" services, which combine communications and data processing. Many industry experts foresee a battle for this market between AT and T and giants like IBM and Xerox.

"Value added" services are those in which the original message transmitted is in some way changed. Examples include computer networking, electronic mail or electronic banking.

● In Britain, the Government's liberalisation policy has removed British Telecom's monopoly over the supply of subscriber equipment and communications services. British Telecom must now compete with private sector rivals in these fields. A consortium headed by Cable and Wireless has been licensed to build and operate an independent business communications system designed to serve the needs of larger business customers.

● In West Germany the Post Office (Bundespost) is striving to transform itself into a more commercial organisation. Though its monopoly remains intact, the Bundespost is seeking to shake off its previous image as a slow-moving public utility by marketing more aggressively new types of service.

What are the reasons for these changes?

First, in most industrialised countries basic telephone service is now available to the vast majority of the population. The industry's focus is starting to shift away from extending the public network to expanding the range of facilities which are available on it.

Second, telecommunications technology is undergoing a profound transformation, which is facilitating the introduction of many new, versatile and inexpensive services. At the heart of this minor revolution lies the convergence of telecommunications and computers around digital technology.

Technology

Until now, telephone systems have used analogue technology. The sound waves created by speech are transmitted as varying frequencies which correspond to changes in the pitch of the speaker's voice. When computers are linked to a telephone line, the binary code which they use must be translated into analogue form by means of a converter known as a modem.

The new generation of digital communications systems is designed to transmit all information as a series of zeroes and ones, outwardly indistinguishable from computer language. Speech is "sampled" at rapid intervals, and the change in voice frequency is coded in digital form and transmitted down the line to the receiving end, where the same process is carried out in reverse to reconstruct the speaker's voice. No conversion is needed to communicate computer data.

The exchange equipment which handles digital communications is very different from analogue switching and transmission equipment. The latest exchanges are in reality specially designed computers, in which electro-mechanical devices are replaced by micro-electronic circuits.

As a result, digital exchanges are much more reliable, flexible and versatile, offering facilities like automatic call-back, conference calls and caller identification. By means of sophisticated electronics, many of the same facilities can also be built into subscriber terminals.

It is not only exchanges which are changing. Transmission systems are also being transformed by the introduction of satellite communications and optical fibres, hair-thin flexible strands made of the purest glass which carry signals in the form of pulses of light. Both are competing to replace copper cable as the standard method of transmitting telecommunications.

Both satellite systems and optical fibres have considerable advantages over copper. They can transmit vast amounts of digital information over long distance at very high speeds, with a far smaller loss of signal strength. Satellite communications are bounced off spacecraft orbiting some 20,000 miles above the earth; in optical fibre systems, the signal needs to be boosted by repeaters spaced every 5-10 miles apart, compared with spacing of no more than a mile required by most copper circuits.

The large transmission capacity offered by both of the newer technologies can be used in a variety of ways. For example, large volumes of computer data can be sent from one point to another at very high speed, a facility which makes them an ideal medium for transmitting live videoconferences.

Alternatively, many different telephone circuits can be carried on the same channel simultaneously. One strand of optical fibre can carry some 2,000 telephone calls, against a maximum of 32 on a pair of copper wires.

One of the leading practitioners of satellite communications is Satellite Business Systems (SBS), an American company owned by IBM, Comsat and the Aetna insurance group.

SBS provides an advanced private communications service for large companies with operations scattered across the U.S. Customers, who are charged a minimum of \$100,000 a year, transmit and receive via earth stations mounted on their office

roofs or in company car parks. A major appeal of satellites is that they allow digital connections to be set up almost immediately between any locations. All that needs to be done is to install suitable earth stations.

One of SBS' major customers is Boeing, which uses the service to enable its engineers to tap from anywhere in the U.S. its vast computerised data bases. So great is the transmission capacity available that the entire contents of Encyclopaedia Britannica could be beamed from one side of the U.S. to the other in a matter of minutes.

But satellite communications is quite expensive—SBS has attracted only about two dozen customers since it began operating in early 1981 and has yet to show a profit.

Satellite costs are also disproportionately high over short distances. The economics of using satellites for communications within European countries are far less attractive than in a country with the land mass of the U.S. In the longer-run, many industry experts believe, they will face tough competition from optical fibre systems.

Many Western countries are now starting to install optical fibre systems in place of copper on trunk routes. The biggest network in the world at present is planned by the Canadian province of Saskatchewan: it will be some 2,000 miles long.

British Telecom has announced plans to build some 300 miles of optical fibre routes within the next few years. And the Mercury consortium, headed by Cable and Wireless, proposes to build a 700-mile optical fibre loop connecting English cities.

Several trials are being conducted into the use of optical fibres in local communications networks. British Telecom is wiring up a number of private houses in Milton Keynes. France plans to link 5,000 households in Biarritz. And the Bundespost is considering a much grander plan to rewire West Germany's entire telephone system with optical fibres at a cost of about DM 60bn over the next 20 years.

Apart from the physical effort of laying new cable, the main disadvantage of optical fibres is cost. At present, it costs about £2,000 per mile, though this

should fall sharply as volume production begins. But optical fibres have many advantages: in spite of their large transmission capacity they are much more compact than copper, require fewer repeaters and are immune to electrical interference.

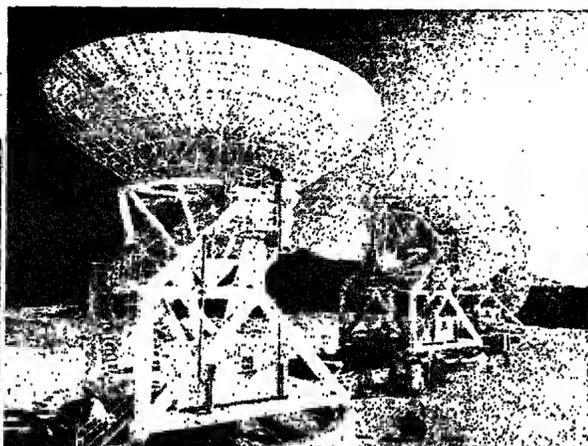
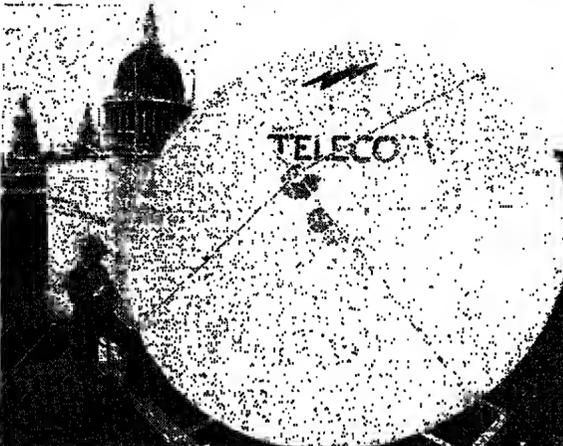
A number of countries are developing both optical fibre and satellite communications. British Telecom plans to launch a satellite business service in conjunction with other European authorities in 1984.

The Financial Times recently carried out a trial of the planned service to relay printing instructions for its international edition from London to Frankfurt. If satellites prove economically attractive, the FT may use them instead of the land line which links London and Frankfurt at present.

Most European telecommunications administrations see satellites as only a stop-gap until they have updated their terrestrial networks with digital exchange equipment and optical fibre systems. But it seems probable that the two types of transmission will coexist for some years.

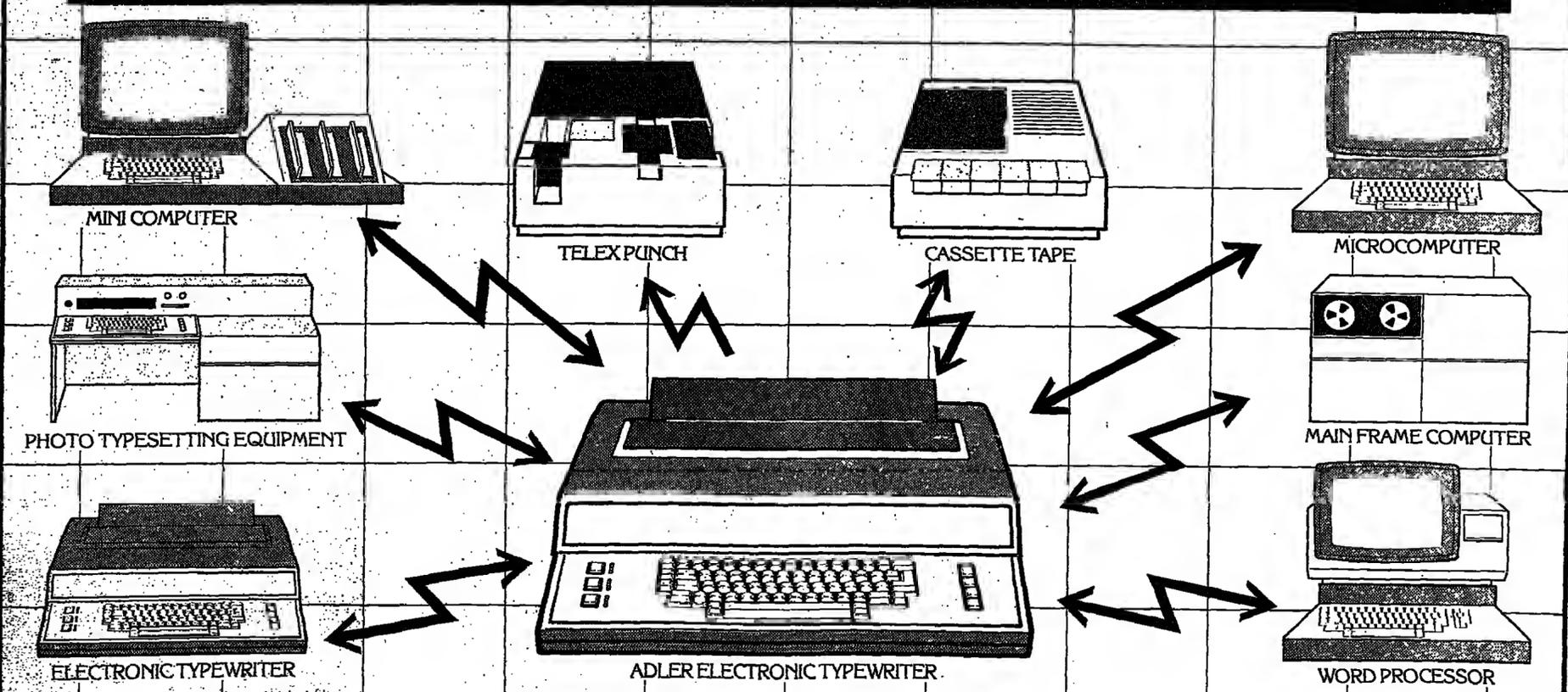


Miles of pure spun glass will soon circle the earth to make a web of communications as optical fibre cables take over from the conventional metallic conductor cables which now make up the network. Telephone cables are the largest single expense in the UK telephone system and scientists have been exploring new and cheaper ways of sending messages. The answer, they feel, lies in optical fibres. Above: technician Jan Harrison (left) holds the new optical fibre cable. Right, in contrast, with right Fred Johnson holds the old-style cable.



The Financial Times recently carried out a trial satellite relay of printing instructions for its international edition, from London to Frankfurt. Right: A huge relay station at White Sands, New Mexico, built by Harris Corp. for Western Union, uses half its capacity to communicate with the Space Shuttle and various satellites.

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THE ELECTRONIC OFFICE IV

Constant progress in the development of floppy discs

Capacity of storage systems rising

BULK STORAGE of the user's data in computer systems has come a long way since it all started in the early 1960s. Paper tape, magnetic tape and punched cards were all that was available so that storage and retrieval of data was painfully slow by modern standards.

Today, big reel-to-reel tape machines are mainly used as longer term "dumps" and paper tape is hard to find. For immediate access bulk storage, most systems use one of a variety of disc stores (on which many millions of development money have been spent), drum stores, small tape cassette and cartridge devices, magnetic cards or bubble memories. Microfilm is in wide use for longer term storage and there are some sophisticated systems on the horizon employing the laser.

Just as the pick-up arm on a gramophone turntable can be placed to play any music band, so the read/write head on a disc store can locate any one of about 100 concentric tracks magnetically recorded on the flat metal oxide surface. There can be several thousand data words (bytes) on each track.

At the top end of the disc spectrum is the fixed head type which has an array of fixed read/write heads—one for each track—making it expensive and unlikely to be found in any but large office complexes. The average time to find a record is about one hundredth of a second. Extraordinary amount of data—a billion bytes or so—can be held on mini-platter dual spindle machines.

Less expensive is the moving head type. A single head is moved rapidly across the disc radius using a high speed solenoid. More data can be accommodated but access is about five times longer than the fixed head type. Moving

head systems can have fixed discs, removable discs in cartridges, or a combination of the two.

The small business computer and word processor have spurred efforts to design lower cost but fast and reasonably robust disc systems. The answer, once again from IBM, came in the early 1970s and was the so-called "floppy" disc. Many other companies have since manufactured it.

The oxide-coated disc is made of thin tough plastic and is held in an eight inch square envelope from which it is never removed: the disc rotates inside it and the head moves over a radial slot.

The mechanics were hard to believe when the technology first appeared, but drive lives of five years are normal. The access time of floppies is about 0.5 second and about 250,000 bytes can be stored on one side.

Mini-floppies

Mini-floppies (the discs are about five inches across instead of seven) have also appeared offering about half the capacity and are proving extremely suitable for microcomputers. Such "micro" configurations can give performances that would have needed a minicomputer a few years ago.

The most important recent development has been a disc technology that IBM called "Winchester" during development—a mere early code name which has stuck. Its secret is the minute space (about 20 millionths of an inch) between head and permanently fixed disc.

The closer the spacing in disc working the more precisely can the tiny magnetic areas on the surface be recorded and sensed. However, the slightest speck of dust can be fatal and the

system has to be totally enclosed. Several of the computer companies and many "independents" offer Winchester. Burroughs for example has a 14 inch drive offering up to 80 megabytes.

Frequently there are two double-sided eight inch discs. One surface is used for head positioning and the other three for data. The result is 10 megabyte capacity, equivalent to perhaps 50,000 names and addresses in a business system.

There is also a "mini-winnie" (miniature Winchester) using five inch discs with about six megabyte capacity. An example of a recent introduction, however, is a unit from Rotating Memory Systems that can have from one to four discs with up to 12 megabyte capacity.

IBM in particular offers magnetic cards, a column and row magnetic recording system used in their small business systems.

Bubble memories made their debut in 1978 and were heralded as the new bulk storage. They consist of a large number of rows of extremely small magnetised areas on a small sheet. Access is row-sequential rather than random but the worst access delay is about one second. With no moving parts or worries about contamination the idea seemed attractive for robust bulk storage.

But Rockwell, Texas Instruments and National Semiconductor have all pulled out leaving Intel and Motorola in the U.S. Basically the problem is that sales are not adequate while other costs mount. IBM has them but does not use them and Fujitsu and Hitachi are both ready.

The other major magnetic system, tape, is applied in office computers and word processors

in the form of the Phillips standard and micro-cassette drives and cartridges from 3M and others. They are usually employed in lower cost systems as an alternative to disc, but access is rather slow at 10 seconds or so.

"Streamer" tape drives are becoming popular to back up fixed discs like the Winchester, where loss of data could be serious. The established method of starting and stopping tape for block recording is done away with (obviating expensive tape capstans) and the tape runs continuously at 50 or 100 in/sec. Up to 61 megabytes can be held on a recently announced Thorn-EMI unit.

Laser systems

There are other systems that are only just coming out of the development stage. For example, a laser can be employed to make microscopic pits in a plastic surface, either in groove form on a gramophone-like disc, or in rows on a card.

Sony and Philips have laser systems for recording and playing back digital video and sound on a spiral-grooved disc. JVC also uses digital bits, but plays them back by detecting microscopic changes in electrical capacitance as an electrode runs over them.

Storage capacity is very high. The Sony 4 1/2 inch disc can hold five billion bits (about 120m words) and read them out at 4.3 megabits per second. Immediate objectives are in the audio/TV entertainment markets, but these discs can also hold computer data. They are of course, "read-only" systems—the data once recorded cannot be altered.

Falling into a similar category is the Drexler Laser Card, about to go into production in the U.S. This uses a plastic

card about the size of a credit card which has very fine silver particles in the surface layers. A fine laser beam burns black holes about five microns (millionths of a metre) across, clearly distinguishable by the reading head from the otherwise highly reflective background. Recording rates are 10 megabits/sec and the card can hold up to a million words of text. This system is also read-only.

However, Bell and Howell and A. B. Dick have similar systems of recording, but with the merit that the impression can be erased and the resulting space re-used.

For bulk storage where one of every many pages of text needs to be retrieved and displayed to a number of offices, a development from Antone Systems of Bournemouth uses microfilm.

Its CRT display terminals (which might be employed for other purposes as well) show pages from a special microfilm store than can hold 4m frames. An indexing system, activated from the display and keyboard, causes the desired film frame to be scanned with a high definition line camera (2,000 lines) to give a picture within 10 seconds.

The frame is held in the display unit's electronic store for read-out on to the screen where it can be updated if necessary, re-photographed with the same kind of camera and the film put back into the mass store.

For the longer term storage of office data, microfilm or microfiche (a sheet of about postcard size carrying many page frames) ought to be seriously considered for cost effectiveness, in spite of the upsurge of electronic systems.

Geoffrey Charlish



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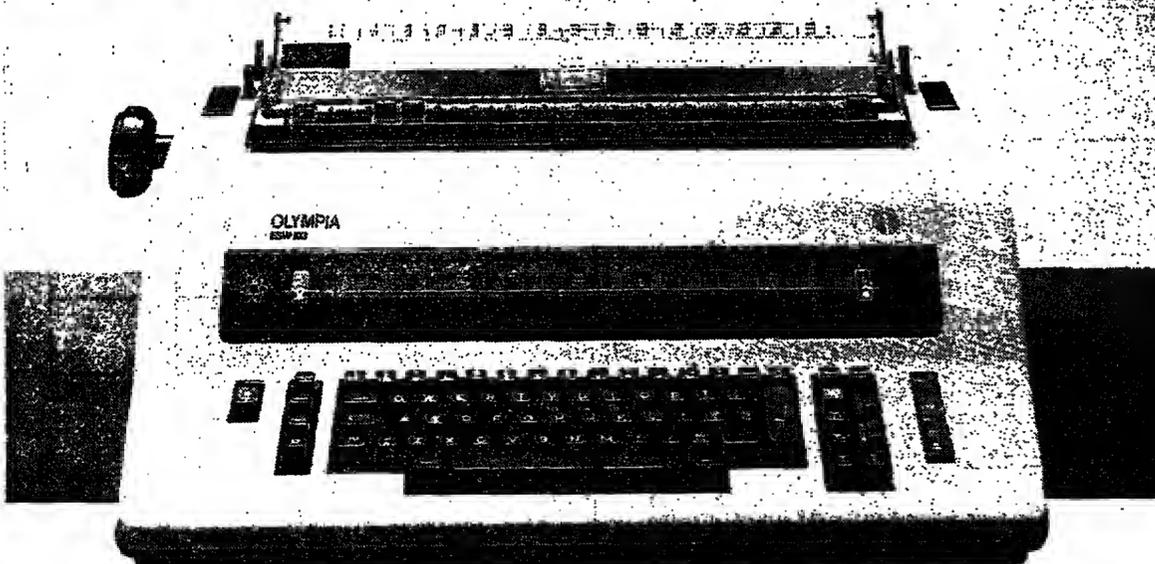
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This new Olympia micro-computer is linked to a 132-character line dot matrix printer. The 64K RAM system, specially designed for small businesses, has the option of floppy disc and hard disc storage

Alan Cane discusses cost-effective methods Better data retrieval a priority

GIVEN enough time and money, Mr John McNulty, the irrepresible managing director of General Robots, told a conference on data security back in 1979 that he could gain access to virtually any data bank.

Nobody disagreed, but the heart of the matter was quickly identified by another conference participant who observed: "With time and money I could get in. Without time and without money, and if you changed your software every week, I could not get in."

The capacity to store vast amounts of information in electronic form is crucial to the paperless office. But what is even more important is the ability to retrieve any part of that information, at will, without taking substantial time or money, and in a form that is immediately useful to the businessman or woman.

Technology is rapidly overcoming the problems of packing substantial amounts of data into small spaces. Successful development of the 64K random access memory, the present industry standard, means that modern microcomputers have up to a megabyte of semiconductor store under their lids—roughly enough to store the full text of 15 average novels.

The new miniature hard Winchester disks—'Mini-Winnies' offer microcomputer systems impressive back-up store. And the large Winchester offers many gigabytes (billions of bytes) of storage in a box about the size of a domestic refrigerator.

approaches. The first is obvious. If the file, document or memorandum stored has a name, and the user knows it, it is possible simply to key in that name to retrieve the document from its electronic pigeon hole.

The task
Information retrieval systems become interesting when the user either does not know the name of the document he or she wants to see, or has the name wrong, or simply wants to browse through a batch of documents covering a general subject area.

In their search for the most cost effective method to provide this facility, manufacturers have tried techniques based on hardware—the physical components of the system—and software—the lists of computer instructions which make the system work.

ICL developed a hardware based system called CAPS—Content Addressable File Store—which used clever indexing methods to speed the travel of a disc drive read/write head to the correct track on the disc. That technology found its first use in a system to give telephone operators fast access to subscribers' telephone numbers.

Now Intel, the distinguished U.S. semiconductor company, has produced a microprocessor system which effectively manages the information stored in a computer's memory.

This "database processor" is unusual because the computer software which actually manages the data is written into silicon chips.

There are a wide variety of pieces of software which will manage a database, but these are usually provided in the form of magnetic tape or a floppy magnetic disc, and the instructions take up space in the computer's main memory.

Intel's hardware database processor sits between the computer and its memory system. It receives requests from the computer goes about finding the information in memory and passes the answer back to the computer.

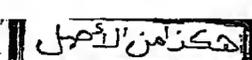
Such specialised computers are not new; but the Intel device brings database management down to the level of the microcomputer—and therefore to the level of the office system.

A similar but larger system developed by Britton-Lee is suitable for larger systems. Some systems mix hardware and software. Burroughs, for example, as part of its strategy for the electronic office launched a device it calls Odsfile. It is basically an intelligent filing cabinet. It can store 1600 characters, the equivalent of 80,000 A4 pages of text, on disc. The device has only one control—the on/off switch.

According to Burroughs, Odsfile can locate any document or group of related documents "with nothing more than an instruction phrased in plain language and containing a name, date, or other words in the sought-after text."

Other companies make similar claims. Datapoint, one of the brighter companies specialising in distributed processing, has a system called AIM which the company claims can retrieve individual words from a stored text. This is a software technique. The companies selling

CONTINUED ON NEXT PAGE



THE ELECTRONIC OFFICE V

Software is the invisible heart of the electronic office, says Alan Cane

Secret of the best system

SOFTWARE is the invisible heart of the electronic office. It is the secret of the best office system — and it can usually be blamed for the faults of the worst.

As a product, software is perhaps even more visually uninteresting than computers themselves. It is supplied as a reel of magnetic tape, a few thin plastic "floppy" disks, perhaps a handful of plastic-cased semiconductor memory chips.

Together with a stack of reference manuals and other documentation, these devices hold the essential instructions which make it possible for the computer to carry out any useful work at all.

From the user's point of view, the technicalities need not be important: what is vital to understand is that software is difficult to write and, as a consequence, expensive. Considerable skills are needed to write software that is efficient and correct.

As Mr Dennis Jarrett put it in his book *The Electronic Office* (Gower/Philips Business Systems): "All computers need software and electronic office systems are no exception: in fact, they need rather complicated software. But good software people are scarce and there are not enough being trained."

He goes on to point out: "It's not a question of entry level, first job programmers. The need is for software maestros with skill and experience. They are expensive."

There are some solutions to the problem. One is the development of packages, generalised pieces of software which can be run on a particular machine or particular series of machines and which carry out a specific application. The

considerable cost of development is then split between a number of users.

Some of these packages designed for office and business use can be remarkably successful. An example is Visicalc, a financial modelling package.

It runs on the Apple II micro-computer (and now many others) and, indeed, is thought to be one of the principal reasons for the success of that machine.

Some 15 months ago, Intelligence (UK), a British software house, wrote Micro-modeller, which also runs on the Apple and which is claimed to enable the technologically illiterate to carry out their own sophisticated computer modelling. It has also sold well — now there is a whole string of Visicalc look-alikes on the market.

Then there is the software factory, the notion that just as robots can build other robots, so computers can be programmed to write programmes for other computers.

At its simplest, this means the elegant programming tools now available to help programmer productivity. A true "programming machine" remains to be built, however.

There are a number of packages on the market which claim to make it easy for the businessman to write his own programmes using simple English and some of these general computer code from simple instructions quite effectively. But beware the slogan: "No previous experience required."

Programming is still a job for the professional: the enthusiastic amateur will have to be prepared to mortgage his or her time, social life and possibly marriage to write useable programmes.

The microcomputer itself is partly to blame.

In the days when computing power was only available in the form of the large mainframe, software specialists developed ways of producing systems software effectively and made it possible to run applications software sensibly (systems software are the instructions which run the computer; application software carries out specific tasks for the user).

The advent of the microcomputer turned this on its head. Limited in power, it was difficult to write effective systems software to run them with a corresponding decline in the effectiveness of the applications software.

The impetus

Mr Edger Dijkstra, the Dutch software maestro, publicly proclaimed the coming of the micro as a disaster for programming.

All of which may explain why, despite the fact that micro-processor based systems are the impetus behind the new office automation, office watchers are seeing an increased role for the traditional mainframe in the office of the future.

Mr Michael Naughton of Langton Information Systems, chairman of the Computing Services Association software group, points out that the mainframe still has the edge in cost effectiveness in the office.

Mainframes are designed for pure throughput — number crunching — and many of the facilities expected in advanced office systems — the handling of text and graphics for example, require considerable processing power.

They also require massive

reserves of memory, and if the cost of memory is falling rapidly in the micro and mini computer areas, it is falling stupendously on mainframes.

Mr Naughton points out: "By the time you have established a local area network, set up your contention procedures and organised effective data retrieval, you've done an amateur job in constructing a mainframe yourself."

Furthermore, many companies both in Europe and the U.S. are establishing videotex systems (systems which use a television set to display information transmitted down telephone lines) to disseminate information among their executives.

As the number of terminals served by any system increases, the power of a mainframe is increasingly required to drive the system.

Mr Naughton believes that local area networking — the concept of linking small office machines together cheaply so that data can be passed rapidly and accurately between them — will be dominated by mainframes.

This would argue in favour of an IBM approach where the mainframe is still the hub of the system and against the Xerox Ethernet concept where there is no overall system controller.

There is no reason, of course, why a mainframe computer should not be attached to an Ethernet system.

With the continued growth of videotex, the idea of the software "gateway" means for a videotex user to get access to a third party database, is taking on fresh importance.

The "gateway" works like this: A Prestel user in the UK can gain access to the pages of information held on British Telecom's Prestel computers

but to no other databank. With a software gateway it is possible for the user to interrogate any other database which is connected to the system.

The best-known example comes from West Germany and involves a small bank Verbraucher Bank and the German videotex system, Bildschirmtext.

Customers of the Verbraucher Bank are able to bank at home using Bildschirmtext and a gateway which enables them to get access to Verbraucher Bank's main computer files.

There are clear problems of security and quality not to mention response time in gateways systems. How should an organisation like a bank allow customers access to its files? The Verbraucher Bank system is well protected by layers of passwords and access protocols, but that will not satisfy all organisations.

Langton Information Systems has written a piece of software called preview which transfers information from the files of a mainframe computer to a videotex system and formats it ready for viewing.

The idea of a methodology for the electronic office is beginning to take hold now in just the same way that a methodology for data processing made sense of chaos in the early days of computing.

According to Mr Nigel Harrison of System Concepts, a new consultancy set up to specialise in office systems methodology: "The use of technology should only be considered when all other components of the office system have been identified."

In other words, even the smartest software will not bring about a more effective office if it is applied to the wrong problems.

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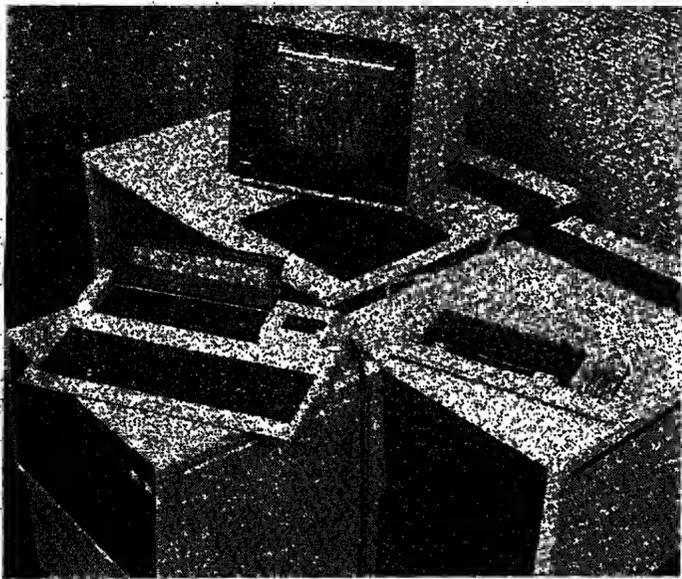
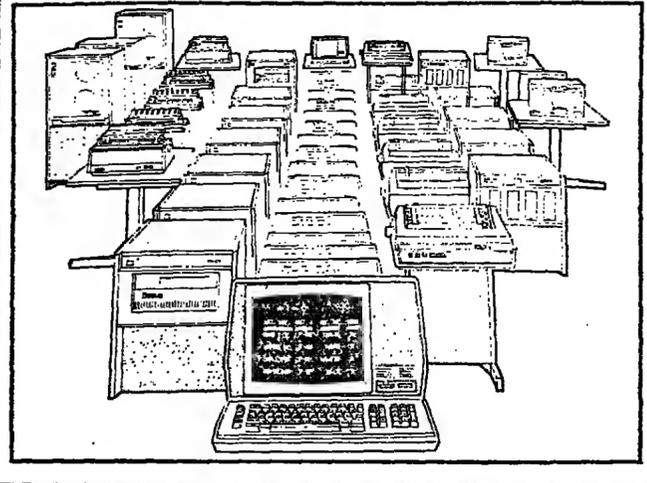
But making it easy to use hasn't compromised Series 21 performance as a sophisticated distributed data processing system. Large disk capacity, multiple communications emulators, high-level programming languages and more make Series 21 systems the best in the business.

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Satellite being launched by Philips business equipment division, is a low-cost text entry system for the P5000 range of word processors. It has the full range of word processor editing functions and an interface which allows communication to the main word processor as pictured above. As at least 75-80% of an operator's time is spent inputting text, the machines are frequently not used to their full capacity. Satellite allows multiple access to a P5000 word processing installation and thus greatly increases the machine's productivity

Improving data retrieval

CONTINUED FROM PREVIOUS PAGE

these sophisticated retrieval systems are secretive about the details of how it is done. Datapoint describes its indexing method as a hologram of the material in the document.

Burroughs says OFISfile is based on two techniques: a way of eliminating redundancy from the stored text and a retrieval system based on the syntactical rules of English.

It is necessary to make a clear distinction between systems such as CAIFS, AIM and OFISfile, which are simply ways of getting quickly to where particular pieces of data are stored in a databank, and database management systems such as the Intel database processor, and a whole host of proprietary database management products which make it possible to rearrange existing stored data for a whole variety of new purposes.

Mr James Martin, one of the most lucid of computer educationalists says a database management system is: "Like a conjurer pulling different coloured handkerchiefs out of a hat. It deceives its users' make believe records from its store of data. It finds out what physical records contain the data in a given request, has a means of locating those records, and from them, derives the logical records that were asked for."

The U.S. software house Applied Data Research markets a range of software products based around Martin's ideas which make it possible for an organisation to build a relational database; a database where many users can have

many different views of the same set of data.

ADR markets Data Designer a software package developed by James Martin which is used in conjunction with a data dictionary to create a relational database. Data Designer is a modelling tool; data dictionary — of which there are a number of proprietary examples — is a piece of software which lists all the data items that are used, their definitions, how and where they are used and who is responsible for them. MSP offers Design Manager, a package with much the same functions.

The growth of the market in database management products is remarkable — probably more than 25 per cent a year. Logica, a UK based software and systems house with a good reputation in communications, developed a relational database package called Rapport. Now the market for a good software package in the computing field is a little like the market for a new pill in pharmaceuticals — it can make a company's reputation and fortune. Rapport is proving just such a package for Logica. In its first 18 months it turned over more than \$1m and continues to sell well.

Rapport is used at more than 70 sites by organisations such as BP, ICI, Unilever and British Gas. The latter is using the package to control and plan financial dealing on the sterling and dollar markets. British Gas money market dealers are able to make enquiries using a

simple interactive query language. They are able to call up information on banks, brokers, portfolios, exchange rates, negotiable instruments and transactions.

"Scrapbook," designed and developed by the National Physical Laboratory but turned into a product and marketed by the software house Triad Computing Systems is not a fashionable relational database system — it was put together back in 1973 — but it does provide its users with facilities for accessing, updating and linking textual records.

Its users include the National Water Council, which uses it to generate and edit text for many of its publications.

Scrapbook is in some ways the archetypal software retrieval system for the electronic office. It stores and retrieves office information, processes text and makes possible electronic mail. And it has been around for a long time and runs on well proven equipment — usually the DEC PDP-11 range or CIL 8000 series.

Triad describes Scrapbook as a company wide data system with better input and retrieval, better security, and better printing.

The perfect database management and information retrieval system for the office has yet to be written, but within a few years systems should be available which will be incomparably better than today's example. The pressure on manufacturers from sophisticated users will see to that.

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OFISfile from Burroughs. Part of OFIS1.

THE ELECTRONIC OFFICE VI

Geoffrey Charlish on developments in screen technology

Trend towards more colour and graphic display

THE FIRST users of the cathode ray tube (CRT) display as a man-machine interface were the military and it was not until the mid-1950s that screens became associated with commercial computers.

The appearance of small business machines, word processors and a variety of other office and industrial devices has driven the peripherals industry forwards with such velocity that there are now at least 200 companies offering terminals based on the CRT, although they are not all manufacturers in a world market that probably exceeds \$6bn, according to market researchers Creative Studies International.

It is set to grow at 30 per cent per annum and will be well over \$10bn by 1985, by which time there will have been a noticeable swing towards colour and graphics in business/office displays.

However, although developments in processors, storage and software techniques will proceed apace, driven largely by very large scale integration (VLSI), display technology will continue to be based for the most part on the CRT.

The reason is not hard to find: the CRT, with its weightless electron beam writing pen is still the most elegant, simple way of producing an illuminated display. It produces the brightest characters on screen, can produce any colour and undergoes continuous development to produce finer detail.

It is not entirely ideal though. The ideal office display would be a lightweight flat panel, unaffected by ambient lighting, which could carry up to 6,000 characters—or equivalent graphics—in colour, be instantly altered on screen and consume little or no power.

Apart from bulk, power consumption and the need for high voltages, the CRT still has the most to offer. Recently, the flat CRT has re-entered the limelight and commercial versions of Clive Sinclair's developments, with a side-mounted electron gun and a beam turned through 90 degrees before striking the phosphor screen, are awaited with some interest.

Other contenders exist however, including plasma and electro-luminescent panels, liquid crystals and the light emitting diode. They all have drawbacks of one kind or another, particularly when it comes to addressable graphics—at which the CRT excels.

But they are being used in single or twoline displays in office systems such as the low-end word processor. In general they need matrices of address wires to make each discrete element light up as required. With the CRT it is simply a matter of applying voltages to a pair of deflection coils to put the spot on the tube face exactly where it is needed, at very high speed.

Laser systems may eventually prove viable. The light beam, like the electron beam, has no inertia and can also be moved about rapidly as required.

In the CRT displays can be produced either by scanning the tube face—as in a television picture raster—switching the

—as in television programme credits—or changed a page at a time at regular intervals. Using the keyboard, a cursor—usually a line under the character—can be moved to any letter or numeral that has to be changed; some areas of the screen can be "protected" to prevent the operator from making such changes.

It is also possible to split the screen into two, and just recently four areas, to allow engineering components can be similarly designed, while machining and other production schedules are automatically produced.

One company, Applicon, is offering Solids Modelling in which the customary wire frame line-only constructions can be transformed into full colour, three-dimensional models, with shadow areas. Products can be seen more or less as they will appear after manufacture.

An advanced approach to graphics is bit-mapping in which the colour and brightness of each picture point (pixel) is held in a memory location in a semiconductor store, where it can be altered to suit some grander plan. At Queen Mary College, for example, a team is working on display arrays which allow pages of information to be handled on screen rather like pages of actual paper on a desk top, but with colour changes, free updating, movement, and so on.

A recent announcement from Computer Pictures Corporation in the U.S. is of Trend Spotter, which combines full colour graphics with comprehensive analytical facilities "so answering the decision-maker's need to be able to quickly assess facts in readily absorbable form. The system does not just display data in a sophisticated way—numerical operations are performed so as to optimise it.

Users can create the charts or graphs they want manually, or the machine will directly interface with the company's corporate database on any make of mainframe through a special interface. The machine takes files from the mainframe and converts them to picture format. After use they can go back to the big computer in their original form or in picture form.

Having got text and graphics, there are systems available for sending them elsewhere over a phone line. Basically, these snatch a frame from the display's video circuits, digitise it pixel by pixel and store it. Then it can be transmitted at any speed to suit the transmission medium. The Finnish company Salora has just announced a system for general application.

Viewdata, of course, allows alphanumeric and graphics to be sent over lines, but there is a speed limitation due to the low bandwidth of the telephone connection. The result is lumpy graphics and rather large alphabets.

But improvements are being made that make viewdata more attractive for in-house business systems. For example, the Canadian Telidon system is now available in the UK with better definition than Prestel, although Prestel 2 is planned by BT for use when the UK's digital phone network is set up.



The Xerox 860, designed largely for secretarial and administrative use and available with either a full or partial page display screen. Previously available as a stand-alone information processor, the use of an Ethernet Interface Board makes it immediately compatible with the network

beam intensity as necessary to build the image or the beam can be used like a pen in the freely addressed mode, producing superior dot-free graphics. The ultimate office display might well be able to do both, possibly on different parts of the screen.

Dot matrix scanning is generally used to build alphanumeric characters. The letters and numbers are held in an electronic refresh memory in computer digital code (ASCII) and on demand are converted by a digital-to-video converter into instructions for the electron beam.

For a line of seven-tall by five-wide dot characters, seven horizontal sweeps are made, only the required dots being energised. Most screens have 24 lines of 80 characters each.

For the screen user all manner of manipulation on the tube face is possible to ease the task at hand, from order make entry in a factory sales office to word processing in a solicitor's practice.

Certain areas on the screen can be made brighter than others for emphasis, or areas can be inverted to black on white characters. The material on the screen can be scrolled

comparison of several fields of similarly formatted data. Such manipulations are feasible in colour, although the cost goes up.

All of these techniques, particularly graphics manipulation, need memory in quantities which would have been unthinkable 10 years ago. But volume production and very large-scale integration (VLSI) continue to bring memory prices down, so that display systems will get cheaper in real terms.

Some extraordinary display achievements are taking place in science and engineering graphics systems such as computer-aided design (CAD) and flight simulation. Doubtless some of these will find their way into business colour terminals, with dynamic graphics that by 1990 will make today's offerings look like child's play.

In CAD, for example, it is possible to construct whole engineering fabrications such as bridges and buildings on the screen and then observe them from any angle—the construction can even be "entered" through a door and looked at from the inside. Or parts of it can be zoomed in for greater detail.

For engineering design offices

Users can create the charts or graphs they want manually, or the machine will directly interface with the company's corporate database on any make of mainframe through a special interface. The machine takes files from the mainframe and converts them to picture format. After use they can go back to the big computer in their original form or in picture form.

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greater importance for businessmen since so much more can be conveyed than by simple alphabets.

So hardware providers are offering ways of capturing the colour graphics data from the screens of VDUs. Several companies are offering printers that will capture a "screen-full" of information, store it and print it out.

It is also possible to take the VDU's video signals and, using a high definition monochrome cathode ray tube, display the three colour signal components in rapid succession to a Polaroid film camera via appropriate colour filters.

The result is an instantaneous picture of what is on the screen, of much greater clarity than that obtained by trying to photograph the screen direct.

G.C.

New printing systems are versatile and noiseless Advent of the laser beam printer

ALTHOUGH THE avowed intent of the electronic office proposals seems to be to do away with paper altogether, they are probably whistling in the dark.

Not only will most of the executives within a company want "hard copy of important computer-derived text and figures, they will also want for their briefcases the graphics that the modern office system can produce.

Letters, even if they are sent by "electronic mail," will presumably have a paper existence at the other end. The fact is that the VDU, for all its advantages, cannot be carried about in car, cab, plane or train.

So for the foreseeable future, perhaps indefinitely, marks will be made on paper. The object will be to make them clearly, in colour if possible, quietly, at high speed and at minimum cost. As with any equipment, some of the attributes have to be traded off against others.

The fast but noisy line printers of the computer room are not suitable for the office and while the newer laser and ink jet machines can be almost noiseless and very versatile indeed, their high throughput and cost rule them out in all but the very large-scale office complexes.

Daisywheel

For office use, two types, the dot matrix and the so called "daisywheel" machines are the most favoured. With matrix printers, each character is composed from a 7 x 5, 9 x 7 or even a 24 x 12 dot matrix. The dots are made by the ends of thin rods, each actuated by a tiny solenoid in appropriate combinations to give alphabetic or numeric characters as the head moves across the paper. Obviously, the more dots there are the better formed the characters can be.

Nowadays such machines are "agile" under microprocessor control. The head moves in either direction and skips over blank passages in the text to increase printing speeds up to several hundred characters per second.

But for letters and reports the characters can look rather "computerised" because of the dot structure and the machines, although fairly fast, can be rather noisy.

The advent of small business computers and word processors spurred the search for a low cost, quiet, compact machine that would give typewriter quality.

The result was the daisywheel type in which a solid font (character set) is carried at the ends of radial webs round the full 360 degrees of the "daisy." The low mass plastics wheel can be rotated at high speed to align each successive character with the print hammer. Fonts are quickly changed by changing daisies. Output is indistinguishable from conventional typing and sometimes is better.

Many such machines bear the Qume or Diablo labels, although the Japanese have entered the market. Speeds are up to 60 characters/sec and prices in the £1,000 to £2,000 brackets.

To get away from the noise of impact altogether, other methods of marking paper have been developed. For example, if the paper is coated with a very thin aluminium layer, a group of electrostatically charged pins can be selectively discharged to the metal at high speed as the paper moves past. Tiny burn marks are left that form characters, albeit still with the "computerised" look.

Xerography can also be employed. On the market are machines with paper-wide beads yielding speeds up to 18,000 lines/min. Electrostatically charged character-shaped areas are impressed on the paper to which "toner" particles adhere and are heat-fused to the surface.

Two quiet and versatile techniques that would be perfect for the office, ink jet and laser, are at the moment expensive for small users.

In ink jet printing, tiny drops of ink are electrostatically deflected to form characters on the paper as it passes. Canon in Japan has just announced that it is working on a system which thermally expels droplets of ink at precise moments from a linear array of 2,000 nozzles over the page width, allowing any kind of pattern to be made. It may cut the cost of the technique.

Versatile

The laser beam, being inertialess, can write very quickly with similar versatility. Hewlett Packard has just announced a machine for £100,000; although this is somewhat below the going rate, it is also not really on for the typical office.

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THE ELECTRONIC OFFICE VII

Keeping in touch by video-conferences

THE OLD adage that a picture is worth a thousand words is likely to prove as true in tomorrow's electronic office as it has been for traditional methods of communicating information.

hundreds of thousands of dollars on its travel budget. But the system may not be as popular with executives who have come to look on travel as one of their most enjoyable business perks.

Some techniques have, however, been developed recently to mitigate the bandwidth problem. One system is known as "slow-scan".

Another newer method consists, literally, of sending only parts of the picture. Instead of transmitting the complete image each time, the system "samples" it regularly and then sends only those elements which change between samplings.

With suitable software (programming), videotex systems can be adapted to perform a wide variety of communications and transaction functions.

At present, the largest single videotex service in operation remains British Telecom's Prestel, though its 12,500 subscriber terminals are far fewer than had initially been hoped for.



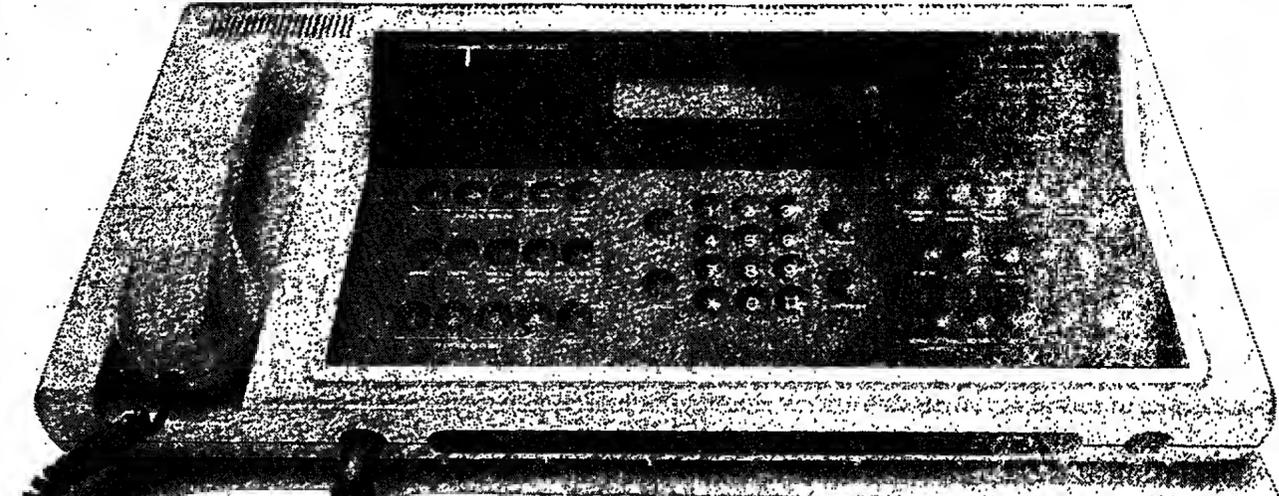
Video systems are being increasingly used in the area of internal company communications, as seen here at the City of London branch of Abbey Life Assurance

optical technology used in the more sophisticated videodisc systems could have widespread impact in another application—the storage of computer data.

Growing market for PABX

THE ONCE humble private telephone exchange is undergoing a rapid metamorphosis. While a number of companies still have manual switchboards with plugs and sockets telecommunication manufacturers would have you believe the modern PABX (private automatic branch exchange) is set to become the very hub of the integrated, automated electronic office.

Systems, IIT Business Systems, Mitel, Ferranti - GTE and Harris. Telecommunications manufacturers in the U.S. and UK are increasingly adopting a broadly similar line that the PABX is the most natural and cheapest way of basing the electronic office.



Makes your phone system look big and ugly.

A typical British Telecom Monarch Call Connect system costs about £5,000 a year to lease, excluding VAT. Enough to make a chartered accountant certified? Not if he works out the sum a middle-sized business spends on a system that's out of date.

Especially on a balance sheet.

Form for requesting more information on new phone systems, including fields for Name & Position, Company, Address, Town, County, Postcode, and Tel. No.

Jason Crisp

THE ELECTRONIC OFFICE VIII

User friendliness in the computer. Alan Cane explains

New methods of input

COMMUNICATING with a computer was, in the early days at least, not for the ordinary mortal. Even the specialists found it something of a chore.

The first successful electronic computer, Colossus 1, built by the British in 1943 to crack German military codes, had its operating programme hard-wired in place, meaning that if the operators wanted the machine to do something different, they had physically to rewire the beast.

The data on which it operated was fed to it on paper tape, which it could read at the quite astonishing rate of 5,000 characters a second.

It is a far cry from Colossus to the kind of input taken for granted these days—keyboard, screen and a roomful of operators entering the data.

It is quite difficult even now to understand the kind of impact key-to-tape (which made the name of Holwalk Data Sciences, now CMC) and key-to-disk (which established the reputation of CMC).

Both these companies realised the value of using a small, cheap microcomputer to validate and format data and store it to make it accessible to a big, expensive mainframe computer without taking up valuable processing time on the frame itself.

All of this has relevance to the period, not over by any means, when most of the data processing carried out by a company was carried out in the computer centre. Again, mere mortals, stay clear!

With the steady "leakage" of computing power from the computer centre out to the periphery, the search is on for better ways for ordinary businessmen and women to talk

to computers and get sensible answers.

Tom Stewart, a consultant with Butler Cox and Partners, who has been heavily involved with the ergonomics (the fitness for human use) of computing puts it very strongly: "My own personal view is that the one issue which will dominate the 1980s is user friendliness."

"User friendliness," he goes on to say, is much used and perhaps overused: "The example that springs to mind is the cash register or till that, instead of having a little light that stays on to tell you it is working, says 'Hello' in its display."

Differences

"That fools no-body," he says: "It is a cash register. It takes money. It is not really saying 'Hello.' All that the 'Hello' is saying is that the power is switched on. That is a gimmick and it is very irritating after a short period of time."

So in looking at new methods of computer input—which is what communicating with a device in the electronic office is all about—it is important to distinguish between the gimmicky and useful, between the valuable and the merely inoffensive.

Hand-written input is beginning to make its mark. The commercial systems available today chiefly evolved out of work carried out at the National Physical Laboratory. The Nacional Financiera Bank in Mexico City has installed a system built by Transaction Security. Their customers have to sign their names on an "electronic notepad" before they are allowed to withdraw cash. The

"notepad" is able to recognise the signature and compare it with stored samples.

Quest Automation has a similar system: its Micropad is now incorporated in a number of other manufacturers' office systems—Rediffusion, for example, offers the Micropad in its equipment as the "write-away" facility.

These systems, however, are somewhat limited. Characters have to be drawn clearly, and they have to be written on specified areas on business forms. Fine for order entry or stock checking, but of little use for free hand text entry.

Hand-written entry, just like keyboard entry is still a slow method of getting data into a computer. A new and exciting idea is the use of digital optical character readers.

These are now able to read a wide variety of type-faces and can scan and enter a whole sheet of text in a matter of seconds. Some of the newer machines can switch rapidly between optical reading mode and facsimile mode. If the machine comes up against a character that it does not recognise as an authorised letter or figure, it simply switches mode and captures the image of that character as a stream of binary digits.

These fast entry methods could save time and labour in the processing of large amounts of text: the input of an entire book or newspaper for full text retrieval, for example, but they are dependent on sophisticated methods of finding and extracting the required

information.

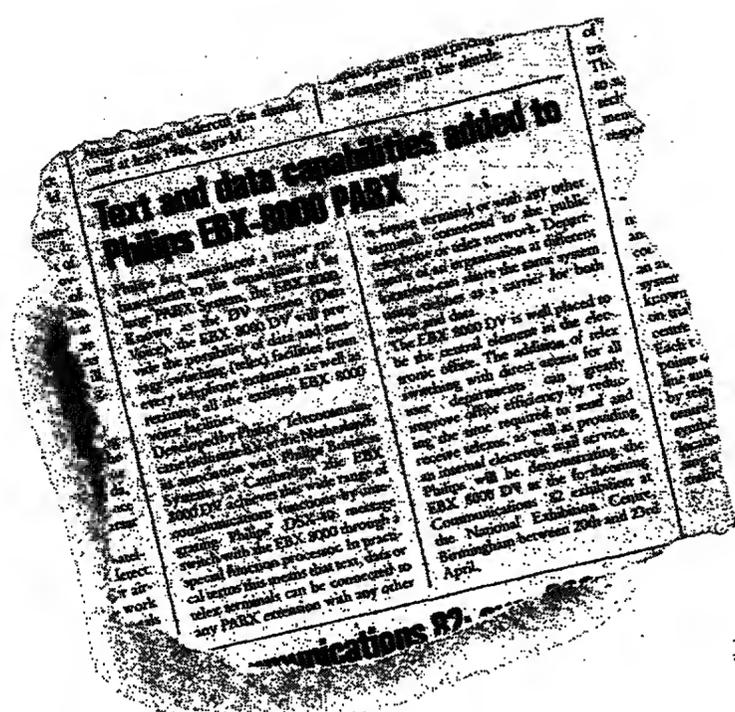
Voice input is perhaps the most exciting prospect. It is also perhaps the most distant, although remarkable progress has been made in the past few years. There is a large difference between the technical problems of voice generation—to produce systems like talking watches and typewriters or automatic landing systems for airline pilots—and the technical problems of voice recognition.

Some of today's systems are able, with careful training, to recognise 200 or so words. But the general belief is that it will take much quicker microchips and much more advanced software techniques—the "Fifth Generation" computer is usually invoked here—before voice input makes significant progress.

In any case, most computer specialists believe there is a long way to go with conventional input techniques before the most esoteric need be used.

Voice response systems are good examples of a simple but effective way of communicating with a computer. The terminal is a touch tone telephone. It generates pairs of audio tones which (as electrical frequencies) the computer can be programmed to recognise and translate into computer language—binary digits.

If the data is entered correctly, a speech synthesis chip in the computer is triggered to pass simple messages down the telephone line—"O.K." "Now give order number." "Thank you and Goodbye." This is all useful information compared to the gimmicks of which Tom Stewart despairs.



For more detailed information on the Philips EBX 8000 DV write to: Philips Telecommunications, P.O. Box 32, 1200 JD Hilversum, the Netherlands. Telex 43712.



PHILIPS

Developments in automated mailing



The latest high-speed mailing equipment from Pitney Bowes, the 6100, is demonstrated at Prudential Assurance in London



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"THE LAST thing I want to see," said Mr John Moody, director of marketing for Pitney Bowes, "is the paperless office." Pitney Bowes, and its principal rival, Roneo Alcatel, plus a host of smaller companies, make their money from machines which handle automatically the growing flood of office mail—with equipment such as sorters, gullottines, inserters, weighing machines and frankers. Mr Moody's worst fears seem unlikely to be realised. While computer and communications companies wave slogans about the office of the future, companies like Pitney Bowes and Roneo Alcatel are experiencing a small boom in machines to handle paper. Ironically enough, the very device—the computer—which has given rise to the promise of the paperless office, is at the root of the growth in the market for automated mailing devices.

According to Mr Robert Gardner, managing director of Roneo Alcatel in the UK, this growth has been a mirror image of the growth of the microcomputer. Companies which automated their administration and their correspondence using the new, cheap microcomputers discovered a new problem: how to deal with the reams of print-out the machines generated. The only effective answer, especially for the middle-sized to larger business, is automation in the mailroom. Which is why Pitney Bowes, Roneo Alcatel, Bell and Howell, Mailing and Mechanisation, Bowe and others are finding it hard to keep up with demand.

The only sector of the market where growth seems depressed is the small business area, where even a small automatic franking machine costing less than £700 represents too much outflow of cash in these straitened times. The major manufacturers make ranges of off-the-shelf machines costing typically up to £10,000 or so. Above that, there are the semi-custom-built machines—monsters which can cost more than £50,000 and which are specially suited to a particular company. Mr Gardner believes the trend is towards smaller, cheaper machines which can be modified easily, or indeed even thrown out if the company's requirements change.

But the largest automatic mailing systems—Pitney Bowes top-of-the-line 3100 Computer Output System—is a good example—represents the last echoes of the splendour of Victorian engineering in the office. They are equipped with electronic controls, these days, to be sure, but there is a rare mechanical grandeur about these leviathans. At full stretch, Pitney Bowes claims, the 3100 can produce 6,000 stuffed and stamped envelopes in an hour.

Why the need for such capacity? More than 26m business letters are posted in Britain every day; and Post Office statistics suggest the major growth is in computer-generated mail. Figures from its own surveys indicate that while business-to-business mail dropped from 36 per cent of all mail to 32 per cent between 1975 and 1980, the volume of what it describes as "advertising, financial and greetings" mail rose from 33 per cent to 44 per cent.

In the same period, the number of holders of credit cards rose from 5m to 12m. So much of this mail is flowing from businesses to private households and comprises financial statements of one kind or another; and almost all of it generated by computer.

Example
Many businesses today, Mr Moody argues, are simply "factories that produce letters." An example is the Scottish Trustee Savings Banks. The four TSBs have a Glasgow computer centre which processes data on all cheque transactions, savings account withdrawals and deposits and cash withdrawals and deposits recorded by the banks' automated teller machines.

Some 4m customer accounts are processed every month at the centre and it also posts all monthly and interim statements of account to the banks' customers. That means some 4,000 to 6,000 statements produced every working day and double that number on Fridays. Until the end of last year, the computer-generated statements were sent to the branch where the account was held for posting. Tedious, time-consuming and expensive. Then the computer centre installed a Pitney Bowes 3100. This machine accepts continuous stationery from the computer printer, "bursts" the accounts into individual documents, trims them, folds them, inserts each item into an envelope, seals the envelope and finally franks it with the correct postage.

This system can run at up to 85 statements stuffed into envelopes a minute. The 3100 COM costs around £35,000, but Pitney Bowes reckons the TSBs could get their money back in 18 months. It works like this: the Post Office gives a rebate on volume mail which is already presorted according to Post Code. In the case of the TSB this is quite substantial—around 20 per cent.

Now the 3100 is fitted with an optical character reader which can scan the post code marks printed on the first page of each statement so it is able to separate the statements into batches. The second class postage bill for 30,000 or so statements a week is about £3,750, or around £200,000 a year. And 20 per

cent of that is a very welcome £40,000. Mr Gardner of Roneo Alcatel believes that UK automated mailing methods are the most sophisticated—anywhere. The British, for example, do not like letters which have been "burst" by machine—and so have ragged edges. Thus, British mailers have to have gullottines to trim the edges. The use of optical mark readers makes it possible for the mailer to treat documents in special ways. The machines can be set up so that a batch of letters are inserted in window envelopes so that the address always shows in the window.

Pitney Bowes is still waiting for Post Office approval for one of its most sophisticated products: the remote meter resetting service (RMRS). At present, postage meters—the devices which are actually programmed with the amount of postage credits a business has bought—have to be taken to a Post Office to have credit entered into the machine.

With RMRS, the user simply telephones a computer centre (run by Pitney Bowes), and responds to a set of questions using a special key pad. If all is in order, the computer issues two reset numbers with which the user can unlock the meter and enter a set amount of credit.

But all of this is spectacular top-end machinery. For the smaller businessman, automated mailing probably means a set of scales and a postage metre, together with a simple addressing machine. He or she will have to decide whether to buy, lease or rent. Other decisions include identifying which functions in the mailroom could profitably be automated. Labeling machines, for example, apply typed or computer-printed addresses to envelopes; folder inserters, which need to be little bigger than a desk-top copier, can save time and energy in businesses which depend on repetitive mailings.

So there are products in plenty—but what is the future for the mailing room suppliers? Will their business not become unwanted with the development of the electronic office? John Moody argues that with the acquisition of Dictaphone, Pitney Bowes has prepared itself for an electronic future. But the electronic office may be some way off. He sees defensive strategies on the part of the Post Office (discount rates for volume users, together with additional services); problems with compatibility of equipment (electronic office standards have yet to be agreed); and education (it will take a generation which grew up with computers to accept word processing and electronic mail) as the principal barriers.

Meanwhile, the automated postroom business will continue to grow at a minimum of 10 per cent a year. A. C.

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THE ELECTRONIC OFFICE IX

A big future is seen for LANs (local area networks) which connect all the equipment needed. Robert Raggett reports

Linking systems: heading for a \$1bn business

THE SELLING of systems for linking together all the electronic equipment found in a modern office... personal computers, data terminals, word processors, copiers, printers, telex machines, telephones...

organisation and capable of permitting each attached terminal to communicate with any other. Although equally applicable in factories, hospitals and universities, LANs are generally considered to be the foundation upon which the all-electronic office of the future will be built.

such as printers, LANs allow workers to share these expensive resources, and facilitate an increase in the efficiency of storing, manipulating and distributing information.

has been little exploited because of the problem of tapping into them without destroying the transmitted signals of light.

subsequent handing over of patented technology to all-comers, was to establish Ethernet as a de facto standard. This seems likely to succeed, and despite conflicting reports coming from the U.S. official electronics standards body, the IEEE, it seems probable that the official LAN standard for buses will be very similar to Ethernet.

One of the simplest ways of building a local area network is to use a modified PABX (private automatic branch exchange) or data switch. This approach is currently favoured by companies such as ITC Business Systems and Plessey.

Ring system

Ethernet does not, in its present form, allow voice traffic to be mixed with data. Other bus systems and a number of ring systems—such as Racal's forthcoming PLANET—do.

Although some front runners are emerging (Ethernet and, for larger applications, Wangnet) there is considerable uncertainty as to which LAN systems will stay the course. So much so, in fact, that companies in the UK like Computer Automation are working on both ring and bus LANs.

As with any highly marketable product, the development of which largely involves the re-working of known technologies rather than the discovery of new ones, there is little consensus amongst present and putative suppliers over the most efficacious way of going about things. At present there are three types of LAN systems which can be considered major—the bus, the ring and the star—with numerous cadet variations on these three themes.

The speed and capacity of LANs similarly has no direct connection with particular topologies. At one end of the bus spectrum a system can provide a transmission speed of 12m bits of data per second and support over 65,000 connected terminals (Wangnet); at the other, transmission speed is 240,000 bits per second with 65 connected terminals (Cluster-One). Rings, in like fashion, range from 60m bits of information per second and 250 stations (Denpas) to 12m bits per second and, for practical purposes, an unlimited number of attached terminals (Domai).

Physical link

The particular topology of a LAN does not dictate which type of cable—coaxial, twisted pair (telephone wire), or optical fibre—is actually used to provide the physical link between communicating terminals. However, the majority of bus and ring structures use coaxial cable, while the star networks generally use twisted pairs. The use of optical fibres

Facsimile transmission, a specialist function

Always the office wallflower

FACSIMILE equipment has always tended to be the wallflower at the office equipment ball—especially in the UK. Although facsimile has long been hailed as on the verge of blossoming into a widely used form of communication it has never happened.

a smaller machine at the other meteorological applications and end. There are three broad categories of facsimile equipment available for general commercial use, with a fourth appearing on the horizon. International standards for each category or group are set by the Comité Consultatif International Telegraphique et Telephonique.

Facsimile is the transmission of a document along a telephone line where the received signals are converted into a reproduction of the original page. In crude terms it can be compared to a sort of remote photocopying, where the copy is fed out at a different location.

At the end of 1980 the CCITT ratified the standard for Group 3 high speed (relatively), digital facsimile. For a number of years the market for Group 3 machines was dominated by Kalle Infotech, a subsidiary of Hoechst the German chemicals company, with a machine made by Japanese photocopier manufacturer Ricoh.

FT A FINANCIAL TIMES CONFERENCE World Electronics THE U.S., JAPAN AND EUROPE: COMPETITION OR COLLABORATION? LONDON— 9 and 10 JUNE, 1982

Japan's emergence as a major world force in electronics and the resulting reactions in the United States, long used to industry leadership, and in Europe are the main themes of this conference. Many vital issues of business strategy and public policy are raised by this conference with expert commentary by the impressive panel of speakers in government and the industry from Japan, the United States and Europe. They include: Mr Gordon E. Moore Chairman of the Board Intel Corporation. Mr Lionel H. Oimer U.S. Under Secretary for International Trade. Mr C. J. van der Klugt Vice-Chairman Philips Industries. Mr J. G. Halseborough Senior Vice President IBM Corporation. Dr. Eng. Atsuyoshi Onchi Senior Executive Vice President and Director Nippon Electric Co. Ltd. Mr Tatsu Kobayashi Chairman of the Board Fujitsu Limited. Mr Kelya Toyonaga Adviser to Ministry of International Trade & Industry, Tokyo. Sir Richard Cave Chairman Thorn EMI plc. M Jean-Claude Hirel Directeur des Industries Electroniques et Informatiques, Ministry of Industry, France. Mr Kenneth Baker, MP Minister of State for Industry and Information Technology Department of Industry. For further details on WORLD ELECTRONICS please contact: The Financial Times Limited Conference Organisation, Minister House, Arthur Street London EC2A 9AX. Tel: 01-621 1853 Telex: 27247 FTCONF G Cable: FINCONF LONDON

At the moment there are more Kalle Infotech compatible machines—sold by Ricoh in Japan and Rapidcom in the U.S.—than there are meeting the CCITT standard. The faster machines are particularly economic for long distance transmission of documents because of the substantial saving in long distance telephone charges. A number of companies are now selling Group 3 machines in the UK including ITC (made by Toshiba), Plessey (made by Hitachi), Burroughs, ITC and SM and Xerox (made by Fujitsu-Xerox). But even Group 3 machines are beginning to look slow. Advances in printing technology using lasers or ink jet systems together with digital transmission (telephone lines are analogue at present) mean a page of A4 can be transmitted in a second. With magnetic memory, such as a disc drive, pages may be sent even faster. In the U.S. Satellite Business Systems, an advanced communications network using high speed digital links between company sites via satellite, can send 70 pages of facsimile a minute. Facsimile has in the past two years become used as a public form of electronic mail. In June 1980 the Post Office started the first public international facsimile link to Toronto in Canada from the London Stock Exchange. A number of other international centres have joined, including New York. Copy sent across the Atlantic is sent by high speed fax (about 2 seconds for an A4 page) via satellite. The service, known as Intelpost, has been extended to a number of towns throughout the UK, using more conventional equipment. British Telecom, which was only legally split from the Post Office last Autumn, has a rival service called Bureafax.



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Jason Crisp

THE ELECTRONIC OFFICE X

Dictation equipment becomes smaller but more sophisticated

Battle is on to capture new markets

SMALL IS beautiful in the fastest-growing sector of dictation equipment — the pocket-memo market which last year grew by 10 per cent while desk-top machine sales decreased slightly.

There are now more than 20 companies supplying portable dictation equipment in the UK. Of these, certain Japanese and German were highly rated in an independent survey by "What to Buy" magazine; they include Sony's BM520; the Olympus Pearl Corder 802; the Assmann MC8; Sanyo's M-1001; and National Panasonic's RN201D. There are at least 55 varieties of portable units now on the market.

Philips has just introduced what is claimed to be the smallest pocket-memo in Britain, the 660, weighing only 144 grams and designed for the busy executive who demands a high performance but small and easily accessible pocket-memo.

As manufacturers rush to introduce smaller and more sophisticated dictation machines, the appeal of the pocket-memo is well nigh irresistible for the busy executive.

Suddenly, says Lanier, the U.S.-based office equipment group, "it's a lot easier to get a lot more done" with its soon-to-be-launched micro-cassette "Pocket Caddy" which, it says, "is designed to fit your hand like a glove" — like the controls of a well-designed sports car... its few buttons are positioned where your fingers are when your hand is at rest, which makes dictation smooth and natural.

Thos. Hill, with its range of neat, Assmann pocket recorders is just as effective about its mini-cassette models that are "lovely to look at, delightful to hold, a perfect partner for anyone on the move who needs to communicate, trap ideas, thoughts and messages."

Mr Robin Hayward, Philips' general manager responsible for dictation activities in Britain, comments that the introduction of the ultra-small 660 pocket memo to Philips' already extensive range, reflects the trend in the marketplace towards portable dictation equipment. Potential users are looking more towards smaller machines which combine the

benefits of desk-top machines such as indexing—with the benefits of an easily portable unit.

Philips, the market leader in dictation equipment in Britain, will introduce further models during 1982 and foresees that as more companies turn towards word processing to solve their word output problems so they will look towards dictation equipment as a logical input to word processing. Olympia, meanwhile has introduced one of the world's smallest dictation machines, the new DG-601 model, which weighs 67 oz and sells for around £87. This mini-cassette unit is compatible, of course, with Olympia's desk-top units such as the DG-602 dual-purpose dictation and transcription machine (with electronic index marking and search facility) and the Olympia DG-508 transcriber unit.

Wizardry

The latest item of technological wizardry from Sony is the tiny BM 510 portable dictator, designed to fit neatly into the smallest hand.

The BM 510 (which sells for about £100 plus accessories) is just over five inches long and only 1/2 in. thick, but despite its miniature size the unit is packed with numerous useful items and has a two-hour recording capability on its micro-cassette.

Features of the BM 510 include a convenient thumb-operated slide-switch control; two tape speeds for selectable recording time; counter-inertial fly-wheel and servo-controlled motor giving a constant tape speed and lower power consumption; built-in microphone, automatic gain control for optimum recording level; an alarm as the tape approaches its end; 3-digit tape counter; and automatic power cut-off systems which prolongs battery life.

Sony also claims that the facilities of advanced desk-top dictating systems are now available to executives in a pocket-sized machine. Advances in micro-chip technology have been applied by the company in the design of its BM 600 dictation-transcriber which uses full logic control to ensure simplicity of oper-

ation leaving the user—be it the busy executive or his secretary—to concentrate on the business in hand.

Weighing only 12 oz, it can easily be carried in the pocket or briefcase. However, its controls are designed for ease of operation in either the hand or on the desk.

The BM 600 provides up to two hours dictation on its micro-cassette and its features include an LCD tape counter and an electronic memory to index points on the tape. This memory is ideal for transcribing as well as returning to the same portion of the tape when clarifying a point during a meeting. In addition, it can be used to repeat a chosen section of the tape—useful when one is learning, for example, a new language.

The UK market for dictation machines for use in the office is approaching £12m a year, while the centralised dictation systems market (including PAX/PBX systems; direct access and separately wired systems) accounts for at least another £1m.

Best-buys listed in the "What to Buy" survey of the desk-top sector include the Assmann M105; Sanyo's TRC-5050 and Sony's TRC-7000.

The latest addition to Philips wide range of desk-top units is system 800 which incorporates many advanced features; it is fully compatible with other Philips dictation products, using the mini-cassette 2, with a visual "mark-and-find" facility.

The 812 is a dual-purpose unit (dictation or transcription), depending on the accessories chosen. The hand microphone allows the author complete control of the unit, while the new, lightweight headpiece and a redesigned foot-pedal give the typist greater flexibility than before.

Another recent addition to Philips range is the pocket memo 195/10 which features fast-forward audible scan. Weighing only 240 grams, the slim design of the 195/10 allows it to slip easily into a pocket. The machine uses the mini-cassette (2 x 15 minutes) compatible with the full range of Philips equipment.

Other models in the company's

range include the 590, designed to give high quality recording with single-handed operation; and the tiny 660 pocket memo, already mentioned, which uses the mini-cassette, giving 20 minutes' recording time. The 187 transcriber provides a transcription facility for both the standard mini-cassette and the mini-in-cassette.

Rising sales

Grundig is steadily regaining lost ground in the UK market, particularly since the launch last year of its new desk-top baby, the Stenorette 2300, a full-feature machine about the size of a paperback book. It can be used for either transcribing or dictating.

The Stenorette 2300 closes the gap between classical portable dictating machines and desk-top equipment, according to Mr Gunter Schroeder, director of Grundig's business equipment division. The company's leading market position in Germany has not only been stabilised, but extended, he adds.

"As far as the German market is concerned, we may have reached the limit of growth, but increased sales are expected from the export market, such as the UK."

Grundig's pocket-size machines (which both won design awards at the last Hannover Fair) are the Stenorette 2000 (selling for £125) and the 2020 (costing £245.00).

The company's diverse products range from several centralised systems to specialised desk-top machines with educational applications. Ten years ago, Grundig commanded a 48 per cent share of the dictation equipment market, although this declined as low as 17 per cent. The figure today stands at around 20 per cent.

While Philips now holds 57 per cent of the UK market, Dictaphone, with its strong emphasis on centralised systems, has moved up to second place.

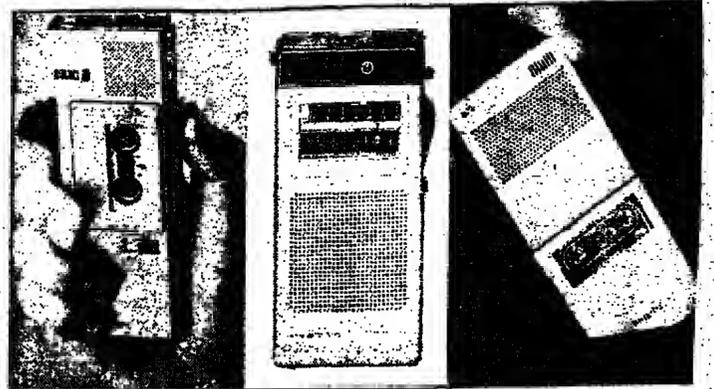
While Dictaphone holds a 62 per cent share of the centralised market, its main product line is still desk-top machines and portable units.

Lanier Business Products, the U.S.-based office equipment

company is to show four new microcassette dictation machines at the International Word Processing Exhibition at London's Wembley Conference Centre (May 25-30).

The new machines are fully compatible and range from a pocket dictation machine with electronic cueing—where alterations to dictation can be programmed to automatically replay before transcription—to a central recorder that can be accessed from any telephone in the world.

The four new products are the Pocket Caddy (with electronic cueing) which sells for around £100; the Insight, a desk-top unit with full digital indexing and work-totalling; the Messenger, a sophisticated top-of-the-range desk-top machine that allows the user to remotely separate dictation according to order of importance; and the Micro-matic III, which can be accessed from anywhere in



Pocket-memos from Sony, Grundig and Philips

the world and provides 12 hours' uninterrupted recording.

Lanier, with a worldwide turnover last year of \$300m, has been remarkably successful in the U.S., where the group also has a 37 per cent share in AES, manufacturers of stand-alone and shared logic word processing systems. Last September, the group introduced into the U.S. a low-end word-processor called "The Easy

One" and also launched a small office computer system, "Computereze," designed for first-time users.

Lanier, which assembles machines in Japan as well as in Georgia, was among pioneers of the endless-loop dictation system which allowed a secretary to start transcribing with seven seconds of the originator beginning dictation.

Lanier's European operations

are headed by Mr Haro Murphey, who expects the company to at least double its share of the UK dictation market by the end of this year. The company began its UK operation in 1976, but in the U.S. it employs 4,000 in marketing, support and services and has spent more than \$20m in search on its last eight products.

Michael Wiltshir

Computerised controls assist documentation workflow

Larger companies benefit from centralised systems

WHILE THE quantity of office paperwork increases every year by up to 10 per cent, the cost of dictating a letter is soaring, too.

Some companies estimate that the cost of an average letter, dictated in shorthand to a secretary, could now be £10, while a letter processed by a more efficient centralised dictation system could cut the cost to £5.

Despite the economic advantages of electronic dictation equipment, only 35 per cent of businessmen use these labour-saving devices. The market potential for the growing range of dictation systems is therefore considerable.

itself more as information technology gradually takes over the office," he adds.

Dictaphone, the UK market leader in centralised systems, has two production-control systems, the Time Master and the Termaster, both designed to connect with the dictation input system and log every item of work and check its progress.

Depending on the configuration in use, the supervisor can locate any single item of work by author, subject matter, typist or other categories and discover its exact status. No longer will anyone have to shout, "Who's got Mr X's letter

of each cassette, which means that the supervisor can allocate work sensibly in accordance with work load.

Modular construction of the system enables an "MT" to be built to meet any configuration of recorders and mix of extra stored dictation capability. Savings on space can be considerable while additional units can be added in seconds.

In a reorganisation last year, Thos. Hill International (which celebrates its 50th anniversary this year) set up two new divisions: the information processing division and the dictating systems division. The first

to existing standard PABX touch-tone telephone systems and accept dictation from anywhere in the world, at any time, and is approved by British Telecom.

When an author lifts the telephone, he or she is answered by a recorded voice which asks for a personal code to be entered on the telephone keyboard. The voice then gives all the instructions and guidance needed to use the system effectively.

Dictation recording is by voice-operated-relay (VOR) that activates immediately speech headings, pauses while the author pauses and continues until the telephone handset is replaced, thus avoiding undue tape usage.

Lanier, which has the largest share of the U.S. market for dictation equipment (39 per cent) has introduced an automated central dictation system, known as Super-Vision III, which will be featured at next month's International Word Processing Exhibition at London's Wembley Conference Centre.

"Using advanced technology to automate the dictation flow from author to transcriber, the system reduces "turn-round time" for users with a heavy volume of documentation and correspondence.

Super-Vision III claimed to be the world's most advanced dictation system is basically a computer to which can be attached a number of separately-wired dictation handsets—and the office telephone system. The advantage this gives is control: the computer can be used to give an instant read-out on a visual display unit of the number of documents recorded over a given period, their length and who made the recording, together with an indication of urgency.

In addition, a number of reports from the system in a block system called "Multi-sort" which, says Lanier, allows users to create their own customised reports: data on all the dictation from, say, the marketing department for the last month; or the dictation of any one individual for the last year; or all the work completed by a particular typist over the last week.

The system also has the facility to print out data about the dictated material at 60 lines a minute.

Philips, while continuing to market its 860 Centralised system, with automatic cassette change bank, is planning to launch an even more advanced system, the 460, later this year.

M.W.

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Even with the advent of word-processing, many businessmen need education about the time-management advantages of these systems, according to Mr Robin Hayward, general manager of Philips dictation activities in the UK.

"To criticise the way an executive dictates letters by traditional shorthand methods is rather like criticising a man's driving—a very emotive area," he adds.

The executive who dictates letters by shorthand "is forgetting to take into consideration the time of two people accomplishing a single objective, while his secretary sits around waiting to hear what he's going to say," says Mr Harold Murphey, head of Lanier's European operations.

Centralised dictation systems offer the most cost-effective means of dictation for the larger company. The main suppliers in the UK centralised market are Dictaphone; Thos. Hill International; Harford Systems; Lanier; Peter Williams; Philips; Sony; Southern Communications and Olympia.

In centralised systems, instead of dictating into one machine and then manually transferring the tape into another for subsequent transcription, the executive simply dictates over the telephone into a central recorder—a modern equivalent of the old "typing-pool" concept.

While centralised systems are more readily accepted in the UK than the rest of Europe, the method is widely used in the U.S.

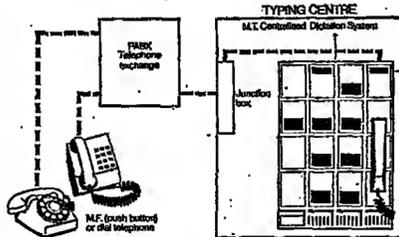
In the 1960s, centralised systems were designed on conventional desk-top machines, linked by selector boxes to telephone lines. In the early '70s, a system evolved based on a direct-link principle—the author recording on the same machine as that used by the typist.

This was Dictaphone's Thought Tank system which revolutionised centralised dictation. Some of today's most successful systems are still based on this principle, but in greatly updated form. The Thought Tank uses a loop of tape so that recording and transcribing can take place simultaneously, while the system decides to which typist's machine an author will be connected.

It does this by assessing the typist's known speed and amount of outstanding work—the result is the fastest turnaround of work for everyone.

Mr Bill Cottle, managing director of Dictaphone, explains that word processing units can be handling literally thousands of individual items of work each week: some will be in dictation, awaiting attention, some will be going through key-boards, some will have been transcribed, some will be in the WP storage and some back with their authors for editing.

"How to keep efficient control of that kind of work throughout is becoming a major role of the dictation input system and will manifest



Among the new centralised systems in the marketplace is the British-designed "MT" from Thos. Hill International. The system's programming facility provides a high level of supervisory control

to Bloggs and Co" which, according to Mr Cottle, is the only tracing method in use in many word processing units at present.

The trend towards automatic work control is significant. As word processing, data processing, videoex, electronic mail and similar systems merge into a more cohesive information processing concept, so the ability to enter fresh information into that system will depend on the efficiency of the dictation facilities.

Dictation from an originator's own desk will be the only practical bulk input method—unless we are all to become our own keyboard operators.

The electronic office of the future may be paperless, but unless we find a better way of conveying management thoughts into information system "bits," speech to keyboard will still be the most efficient input method, says Dictaphone.

Thos. Hill, the Newcastle-based group which has around 600 centralised installations in Britain and claims to have a third share of the user-market in UK centralised systems, is encouraged by the swift success of its recently launched "MT" system.

The British-designed "MT" uses mini-cassettes and is claimed to be a considerable advance on anything else in the field: it offers stored dictation capacity with greater productivity, control and convenience for both author and typist.

Mr Harold Walker, product manager, says the MT centralised system represents a fundamentally new approach, combining microprocessor control with 25 years' experience in centralised dictation.

Its features include electronic switching from one cassette to another, multiple record heads with accessibility to all tapes in the system, a print-out on stored dictation and the ability to work with nearly any telephone exchange system without the need for such costly extras as special interfaces.

"The 'MT' has a work programming facility which provides a high level of supervisory control. Access to the system can be limited either to the number of authors per cassette or to a time percentage

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THE ELECTRONIC OFFICE XI

The benefits that word processing brought to Cadbury

Looking beyond cost-saving

THE EXTENT to which efficiency of input can make or break a word-processing department is shown clearly at the head offices of Cadbury, the confectionary division of Cadbury-Schweppes.

The company first installed a direct-link system at its Bournville, Birmingham, offices, about 12 years ago. This provided executives and clerks with an instant on-the-desk means of dictating letters and reports, straight to the typist who was to transcribe them.

But by the time Cadbury came to install word-processing equipment, however, that dictation system was ten years old. It had gradually lost recording quality and overall reliability, slowing down the typists almost unacceptably until the word-processing equipment brought the problem into sharp focus.

Keeping a log

Mr Donald Pitt is word processing development manager for Cadbury, although his department takes work from the Cadbury-Schweppes, Cadbury Typhoo and Kenco companies' offices at Bournville.

Word processing is used for replies to customers' queries and information requests for the consumer services department, drafting of contracts and conveyances for the legal department, the buying department's purchase orders and standard letters.

Among the largest users are the sales accounts departments whose letters can be typed faster with aids such as automatically entered phrases and dates within standard letters.

The department uses two Datatext IV shared logic systems with four full-time, 11 part-time typists and two supervisors operating them via visual display units. Before word processing was introduced there were 60 typists doing the same (or less) work.

A systems study determined initially how many typists would be needed but soon after the word-processing unit started, a work backlog, at peak periods, of up to two days began to develop. One of the causes was pinpointed to low quality audio input.

Poor recording quality was causing word processor operators to back-track over indirect passages and the proportion of work requiring re-typing was on the high side. Cadbury decided to retain the principle of direct link dictation but to bring it up to date. They chose a Thought Tank 193 system from the Dictaphone Company.

Executives may still use a telephone on their desk to dictate. For most people, this is the PABX phone (Cadbury use an ITT 4080 electronic exchange), but the sales accounts departments have 38 telephones solely for dictation purposes.

The Thought Tank system puts each caller through to

whichever of its eight recording machines is used by the typist able to do the work soonest. This is arrived at by automatically comparing outstanding work on each recorder with the known speed of the typist.

Outstanding work for each typist now seldom exceeds 10 minutes—which speaks volumes for the recording quality—yet though work levels are rising all the time. The system is designed so that typists could be keying in work which was dictated to them just 12 seconds earlier—the kind of fast input which allows word-processing to reach its maximum efficiency.

1,000 items

On an average day, Mr Pitt reports, the bureau's typists process one thousand items—although this can be only an approximate measure since "item" covers everything from a standardised memo to a pre-drafted report. A new management information scheme uses statistical data from the word processor to keep an accurate picture of the department's work.

Adjustments in staffing, equipment and organisation may then be made in advance of problems, not after them.

Centralised dictation and word-processing at Cadbury has paid dividends: A cost-saving of

more than 40 typists is obvious but, in the long-term, comparatively unimportant.

"That kind of sum can be used to justify the dictation and equipment to an accountant," suggests Don Pitt, "but not to me. I consider the more important benefit to be the improved typing service that my department provides and the time-saving which the clerical and executive staff make now that correspondence is a matter of telephoning letter references and variable data only."

In fact, far from being content with improvements so far, Don Pitt as a word processing expert, has some personal reservations.

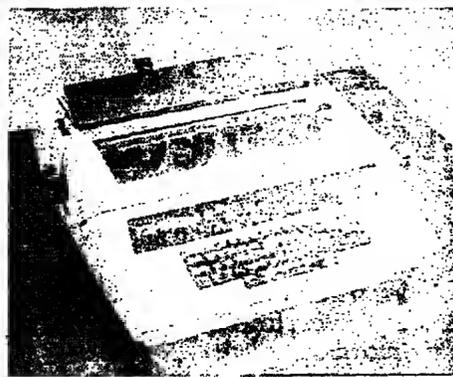
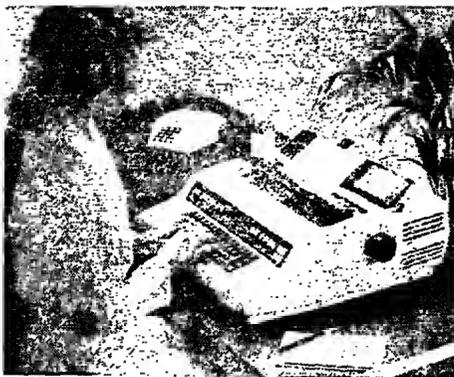
"We must take more account of the job satisfaction element in the future of word-processing," he says.

"On a shared logic system, such as ours, the operators are keying in bits and pieces of data dictated to them without ever seeing the finished results of their work in hard copy."

"We cannot regard typists as automata; somewhere along the line technology must be applied to making the work interesting as well as efficient."

That worry comes from one of Britain's leading exponents of word-processing techniques — suppliers, take heed.

M.W.



Electronic typewriters

The Xerox electronic typewriter, model 620 (top, left) includes a display that shows the material being typed. It also allows the operator to scan through a document to see an area of text to be revised. Top, right: the Xerox 615 model which can play out a full page of error-free copy for financial documents and multipart forms



Olympia's ES 150 word-processing system, above, allows typists to correct errors and make alterations to text while those parts which were originally correct are retained in the system



The 293 centralised dictation system from Dictaphone

What a centralised dictation system did for the Automobile Association

How to speed up correspondence

THE ADVANTAGES of a centralised dictation system is indicated by the way it has speeded up the processing of correspondence by the Automobile Association, which has a membership of 5.3m.

In 1979, the AA decided to install the 0260 automatic remote-controlled dictation system from Philips. The system, based on the minicassette, was compatible with other dictation equipment—again from Philips—used by the AA at its headquarters at Farnam House, Basingstoke.

The 0260 dictation system has thus been installed at AA offices throughout the country. There are 10 machines in the Newcastle office being used by 400 dictators answering insurance queries; eight machines at Basingstoke and others at Headle Hulme, Cardiff and Eskine, Scotland.

Used for replies

The automatic remote-controlled dictation system operates over the internal telephone lines. Authors on pre-selected internal telephones wishing to dictate dial predetermined digits to gain access to a machine.

On connection to a free machine, the dictator hears a one-lasting for three seconds and the machine then switches in to record. There are eight dictation functions—such as word, stop and playback—which are controlled by the telephone; thus, by dialling a certain number the author is able to rewind the tape, listen and maybe revise the dictation.

The machine, which uses 24 minicassettes, can therefore take up to six hours unattended dictation, although the machines themselves are in operation 24 hours a day.

The machine is fully automatic, but a bank operator supervisor is always on hand to deal with letters which require priority attention. If this is the case, the dictator dials digit 8 which alerts the supervisor by a light on the panel. The supervisor presses the priority button and the cassette is ejected after dictation for the supervisor to take away for immediate transcription.

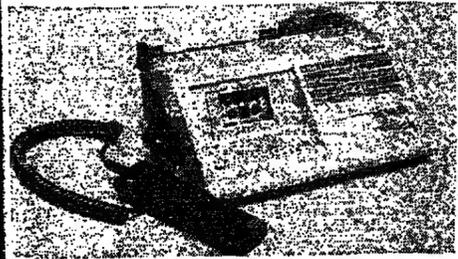
When the author replaces the telephone at the conclusion of dictation, an end-of-letter mark is automatically made on the index slip. All typists and supervisors use the Philips 304 automatic transcriber machine, enabling them to immediately locate the end-of-letter mark or a special instruction mark.

The supervisor maintains a log of all dictation, entering the name and department of the author, the length of dictation and time received. An index slip is attached to the cassette, then placed in date and time sequence for selection by the typist.

The benefits in comparison with a file system—where the dictator sends the cassette and accompanying file to the centre for typing—are innumerable. Firstly, by using the 0260 remote-controlled system, the dictator can keep the file and have it at hand for dealing with further enquiries.

Secondly, there is no opportunity for the file or dictation to be lost in transit—and whilst the author is dictating, the phone is engaged and he cannot be interrupted by phone calls. Furthermore, the user can dictate a letter immediately over the phone, rather than doing it all perhaps at the end of the day.

Michael Wiltshire



The 312 desk-top dictation and transcription unit from Philips

Given more time to think, an office clerk could come up with the odd original idea.

In 1905, a young clerk in the Swiss Civil Service, a man with a mediocre academic record, wrote a paper which was to become known as the Special Theory of Relativity.

Albert Einstein had learnt to think.

His method was to hold the problem of the moment in his mind relentlessly and without distraction.

One way he achieved this was by never bothering to commit facts to memory. He felt it would clutter his mind, needlessly. There were better uses, he thought, for the human brain.

Imagine how much time and potential people in business waste with routine workaday drudgery. Chores that simply have to be done before the real work can be started.

Xerox build machines designed to take exactly that kind of chore off your back.

For example, you could have an information processor or word processing system that can edit, store, retrieve and generally manage figures and text automatically. Saving you hundreds of hours a year, time you can use to be creative, to think, to make decisions, do the things only you can do.

There are work stations for professionals and managers which can create, modify, store and retrieve



text, graphics and records, thus reducing the amount of preparation in producing information to make business decisions.

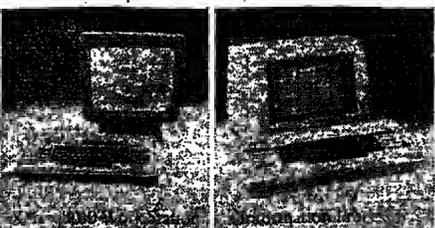
There's our Ethernet system, a method to link your office machines into a single integrated network. It organises information and makes it available to you anywhere, instantly, in any form.

Think of the administration time that would simply dissolve away. And by doing all this our machines give you time. Time to do the things that only you could do.

RANK XEROX

We give people time to think.

For further information ask the operator for Freefone 2279 or call 01-380 1418 any time.



WangNet. The most important step in managing information since the computer.

Business people have an unlimited appetite for information. Which explains the dazzling array of office equipment being created to handle it.

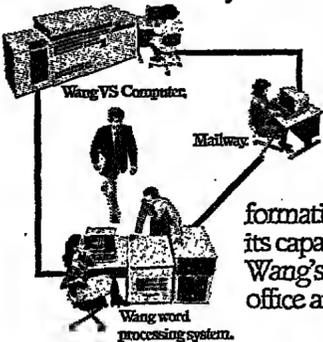
And WangNet lets you link all that equipment together, into one network everyone can share.

An information pipeline.

WangNet works something like your electrical system: you put outlets where you need them, then just plug in your equipment.

The WangNet cable can connect Wang computers, word processors, and electronic mail; as well as information processing equipment made by other companies. WangNet even handles microwave and satellite communications. Video conferencing. Graphics. Security. And energy control.

What does all this mean? It means anyone in your office can get any information they need. Instantly. From another department, another floor, even another country. Resulting in faster, better decisions. Less frustration.



And saving your company money. And since it's always wise to plan ahead, you'll be glad to know WangNet carries all this information using less than half its capacity, leaving room for Wang's next breakthrough in office automation.

For more information on WangNet please call (01) 496-0200.

Or send this coupon to: Wang (UK) Limited, Wang House, 100 George Street, London W1.

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Title _____

Company _____

Address _____

Telephone _____

1153/FT4132

WANG

Making the world more productive.

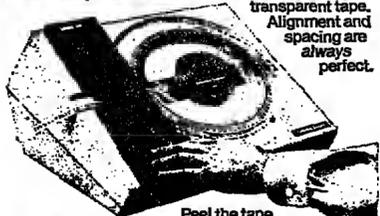
This is dry transfer lettering
 This is hand lettering
 This is stencil lettering
 This is typeset lettering
 This is Kroy™ lettering*

Only one of these can be done quickly and economically in your own office.

This is Kroy lettering.

It's a revolutionary technology. Now anyone in your office can get high quality type instantly with this remarkable system—the Kroy 80® lettering machine.

You just turn the type disc to automatically position the letter and push the button. Out comes a quality type on transparent tape. Alignment and spacing are always perfect.



Peel the tape from its backing and position the type wherever you want it. It's that easy!



It's 5 times faster. If you've ever used dry transfer lettering, you know how long it takes to complete the job, and then a letter or an entire line can be crooked. Not so with Kroy lettering. All the letters are in a straight line. Your job can be completed 5 times faster than dry transfers, and at least twice as fast as stencil lettering. There's no time lost waiting for outside typesetting.

It's economical. Kroy lettering can cost you less than 4p a word. You can expect the Kroy 80 lettering machine to pay for itself in a very short period of time. Find out the many ways of using Kroy lettering cost effectively in your business from our free brochure. Just complete the coupon.

It's professional quality. Look at the headline of this ad. Compare Kroy lettering with hand lettering or stencil lettering. There's no contest. Now compare it with dry transfer and commercially set type. Notice how Kroy lettering has the same high quality.

It's used everywhere. In our free brochure, you will see how people are using Kroy lettering. Because Kroy lettering will make you look very professional, you can expect to make a better impression.

It's perfect for making presentations, for title boxes on engineering drawings, for overhead transparencies, flip charts, microfiche and slides.



Imagine using it for newsletters and leaflets. Office forms, name badges, labelling, file folders, TV storyboards, note books and charts. Anywhere you need words you can use Kroy lettering. Now think of all the things you can do with Kroy lettering.

25 type faces. You can choose from 25 typefaces in sizes from 8-point to 36-point. To change typeface on the machine, simply change the type disc. It's as easy as changing a record on your stereo.

Free brochure. We'll send you a free brochure and sample of Kroy lettering. We can also arrange to show you the Kroy lettering machine at your office with no obligation. Post the coupon below or call Reading (0734) 861411.

Kroy (UK) Ltd., Imperial Way, Worton Grange Industrial Estate, Reading, Berks.

Please send me my free full colour brochure and sample of Kroy lettering.

Show me the Kroy lettering system at no obligation in my own office.

Name _____ Title _____

Company _____

Address _____

TEL No. _____

Kroy lettering machines cost from £250 to £450, depending on the model you choose. Kroy® and 80® are trade marks of Kroy Inc.

THE ELECTRONIC OFFICE XII

An increasingly effective role for the ubiquitous telephone

New telephone terminals offer greater flexibility

EVERY OFFICE has at least one piece of hardware which makes an electronic communications network feasible. The ubiquitous telephone which in the 1980s promises to play a key role in the development of the electronic office.

Companies are only slowly coming to realise that a cable-linked device to every office and most private homes offers considerable benefits when linked up to other equipment, such as a video screen. Moreover, data can be rapidly transmitted to a computer via a telephone line.

The telephone network promises to become even more effective—in spite of the challenge from satellites and specially laid cables—because of the rapid technological development of optical fibre cables, which will enable a dramatically increased amount of telephone traffic to be carried.

But it is the viewdata systems, such as British Telecom's Prestel, which are spearheading the revolution in telephone use. Unfortunately Prestel is not turning out as successful as some of the other videotex systems that have been developed to use the telephone network.

Prestel has only about 13,000 subscribers, about a quarter of the number originally considered likely by this stage, and the number of times each Prestel user looks at a page has halved.

The problem with Prestel was that it was marketed too generally to both private and business users. Not surprisingly, the system has fallen between these two stools and few private subscribers are in the network. One drawback is the cost of using the information kept within the 200,000 pages plus the cost of the telephone call. A residential subscriber could easily run up an annual bill of £200 for quite basic information, according to some estimates.

Main appeal

Prestel's main appeal so far has been to business users. In the travel industry, in particular, the system is used to obtain information about airline and train schedules and package tours. There is also a steadily growing base of users seeking market information about currencies, commodities, share prices and similar data.

But while Prestel has not caught on in the way at first hoped, other private viewdata or videotex systems—linked to the telephone network—have



The Plessey Prestel-viewdata terminal which incorporates voice and data communication in a compact desk-top unit. It has been described as "the telephone of the decade which will bring voice and data communication to the fingertips of most businessmen."

become successful. The London Stock Exchange's Topic share price service, for example, is flourishing and even IBM is offering its customers viewdata as an addition to its computer systems.

BL has developed a system, Stockator, which enables dealers to locate any BL car held in stock by other BL dealers throughout Britain. Dealers are being linked together by a system which consists of Philips Business Equipment viewdata terminals, linked by privately rented telephone lines to the main BL computer centre at Redditch. To avoid high telephone costs being incurred by dealers far from Redditch, relay stations are being set up in the main regional cities.

Dealers can also use the system to call up a large amount of information for a customer in the showroom, such as prices, specifications, and even running press appraisals, apart from being able to tell the customer on the spot how quickly he can get a particular car not in the dealer's stock.

Debenhams, the department store chain, has branched out into private viewdata systems with a new subsidiary, Disc

Debenhams is also beginning to use the system internally. Directors have viewdata-adapted televisions at their home. On Sunday nights they telephone the Debenhams viewdata computer at Taunton, Devon, for detailed figures on the previous week's sales in all the stores throughout the country.

Branching out

Rediffusion Computers has the largest share of the market for private viewdata systems. It has sold 120 systems, including among its customers two retail outlets—Milllets, the camping and clothing shops, and Findlays Hardware in Scotland.

For the businessman on the move, portable terminals have been developed which can link into a private viewdata network or a public system like Prestel.

The system, made by Zycor, is called Teledex 5000 and is contained in a briefcase. This includes an alpha-numeric keyboard, acoustic couplers and modem which link into the telephone network. Mr Ken Williams, Zycor's managing director, says that with the terminal and access to a television receiver, perhaps in a hotel room or on a customer's premises, information such as

orders can be sent on the telephone lines to the main computer.

The system costs about £700 and has already been ordered by European banks, newspapers, and companies with large sales forces.

There are other, less sophisticated, ways in which a telephone can be used. The commercial possibilities of the answering machine have hardly been explored. The machine could be used as a means of communication on a day's stock levels between, for example, a supermarket chain and its branches or in taking orders for advertised goods and services.

A scribophone, or writing telephone, enables the user to display drawings or graphs on a video screen attached to the telephone. By writing on a sensitised electronic pad, the speaker can alter a drawing during the conversation.

A portable telephone also has considerable advantages for the executive on the move, who wants to receive calls when away from his single, fixed telephone. The only drawback is that it is illegal—although widely available—since the Home Office will not release the necessary radio frequencies.

David Churchill

A surge of growth in the mobile communications sector

Systems for the man on the move

THERE IS still a growing market for mobile communications systems in Western Europe, despite the recession. Factors behind the industry's growth are strides in the technology which improve equipment design and keep costs down; the need for companies to keep in contact with essential personnel so that they can adapt quickly to changing situations; and, to a lesser extent, a desire to reduce fuel costs.

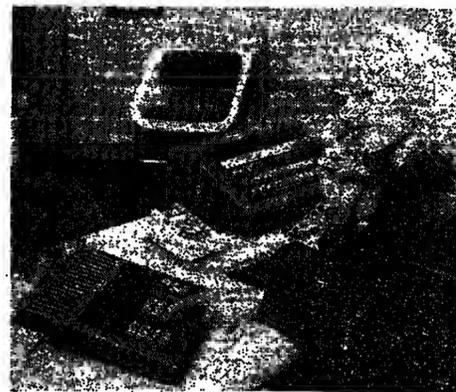
One of the main reasons why mobile communications has not become a larger sector of the telecommunications industry is due to the stringent regulations which govern the allocations of the radio frequency spectrum, coupled with the general congestion of the airwaves.

Mobile radio has to compete for air space with other services such as broadcast radio, television, and even military services, all of which seek to increase their existing allocations.

However, Citizens' Band radio system has now become established throughout Europe, following the boom in the U.S. in the mid-1970s. Britain was one of the last countries in Europe to legalise Citizens' Band radio in November last year.

CB radio offers to small businesses and to the public alike, a very cheap means of communication, albeit with a limited transmission range of about 10 miles or so. Though much of the available channels on CB service seem to be aimed at pure social communications, it does allow a small service company, for example, operating in a limited area, the opportunity to change work schedules at short notice and warn of problems.

Many mobile equipment manufacturers believe that once companies see the benefits of CB radio—and its limitation—they might be encouraged to adopt a more professional system.



This radio-paging system, the Access 1800 from Multitone, offers either single or dual-channel operation on one or more frequencies, with access via manual control units or via telephone and remote contact facilities.

dictated that each business had a dedicated frequency in a particular area. However, such regulations have been relaxed in Britain and the concept of community repeaters is now accepted, although it has been operating for many years in countries such as the U.S. and France.

This system means that a business with only two or three vehicles can share a mobile system with several other users, so capital costs are lower and the company still gets a private service.

In the U.S., companies such as Motorola and General Electric operate more than 7,000 such repeaters, with up to 200 customers connected to each repeater. In the UK, services are offered by companies such as Sormo and Motorola.

Free, which is part of the Dutch Philips group, is the market leader in mobile radio equipment in Britain, competing with companies such as

that its car telephone facility is growing at a rate of at least 10 per cent a year.

Today's car telephones can either be operator assisted or automatic, allowing the user to dial national and international calls directly from the vehicle.

For those people who are moving around on foot, radio pagers are becoming more sophisticated, rather than simply beeping. They are capable of transmitting short voice messages. Air Call, for example, has just completed investing in a new computer control system for its network of radio pagers—it is the largest service in the UK outside British Telecom's.

Its national network of pagers allows the customer at his own premises to record messages into a computer, which are immediately transmitted in the relevant pagers up to 40 miles away.

British Telecom whose equipment is provided by companies such as Multitone and Pyc, completed updating of its network this year. Users of the BT system can opt for a nationwide facility or for the pager to be activated in one of several of the 40 zones into which the country is divided.

There are occasions, however, when motorists do not need direct communication with the office, but they may well require information about morning and weather conditions which could hamper a journey to an important business meeting.

In West Germany and some other European countries, a system called ART is now in operation which automatically interrupts radio programmes when a problem arises. Since the country is divided into zones, the motorist only receives information relevant to the area through which he is driving.

In Britain, the BBC has also developed an automatic radio information service for motorists, but problems with allocation frequencies and money to run the Carfax service is hampering its introduction.

Elaine Williams

THE ELECTRONIC OFFICE XIII

Japan threatens the dominance of Xerox, says Jason Crisp

The fight intensifies for the copier market

THE JUNGLE warfare being waged in the copier industry shows little sign of abating. Despite occasional efforts by some companies to raise prices, the overall trend continues downwards. There are over 200 machines on the market, often wearing several different colours, while the advances of the Japanese into Europe and the U.S. continue.

Still dominant but increasingly besieged is the Xerox empire — Xerox, Rank Xerox and Fujii Xerox — which has the largest revenues both from its installed base and new customers.

Although Xerox has fought back fiercely with new products and undergone major cost-cutting exercises, both in Britain and in the U.S., it faces the increasing problem of the apparently unstoppable advance of the Japanese.

At the front of the Japanese column is Ricoh, which claims to have the largest share of the world market in units. In the UK, Ricoh copiers are sold by Kalle Infotech, a subsidiary of Hoechst, the German chemical company, and by Nashua which, in spite of its name, is a U.S. company.

In the U.S. they are sold by Savin. Within the past two years Ricoh has begun selling copiers in both markets under its own name for the first time. Its agreement with Nashua is now being renewed.

The other major force in Japanese copiers is Canon, which has been making significant advances with a strong range of competitive products, says Mr Philip Oppenheim, of *What to Buy for Business*.

Five areas

Broadly speaking, the reprographics industry can be divided into five slightly overlapping areas. At the top of the range there are offset duplicators which offer a very high quality and a low cost-per-copy, but have a high capital cost.

Second, there are the top-of-the-range plain paper copiers which are very fast, high quality and have ingenious devices for collating reports. It is an area dominated by Xerox which would claim a quality of reproduction to challenge offset duplicators and the copier is certainly easier to operate.

The other main challengers in this area, for the moment, are IBM, Océ and Kodak. At the very top end of this range Xerox does not face any competition except from offset duplicators; Canon and Ricoh are expected to enter this area.

The third area, the low and medium-speed plain paper copier, is the front line of com-



Mr Roger Leeks, marketing director of Kodak, reports "a very encouraging number of installations" for the recently-launched Ektaprint 165 AF plain paper copier-duplicator. The equipment may be bought or rented

petition and there is a host of contenders. European competitors include Océ, Gestetner, Ronco, Alcatel, Olympia, Olivetti and Rank Xerox — although some machines are Japanese-made.

The Japanese competitors include Canon Ricoh, Minolta, U-Bix, Toshiba, Sharp, Mita (sold variously as Mita, Gestetner, Océ Imperial and Olivetti), and Cybernet (sold as Dectimo, Hermes Facit and Ronco).

Very broadly, the market can be divided into two: on one hand there are large organisations which will have a number of small machines distributed about a building as well as a large fast copier for long runs of high quality reports. Copier salesmen argue that distributed small copiers save time as they are near at hand and reduce queuing. Office managers say it encourages staff to make too many copies.

The second major market area is with small businesses and professional practices, trading up from coated paper copiers or using bureaux.

It is in this area where, perhaps unsurprisingly, there have been the most dramatic price cuts—sometimes a customer may find a copier has fallen in price by more than a half within 12 months.

The quite dramatic price-cutting in plain paper copiers has begun to cause significant problems for the fourth area, coated paper copiers. Although coated paper copiers start below £100—such as 3M's Scotch

copier — prices can go up to £1,000 at which price it is possible to buy a plain paper copier.

Coated paper, or "electrostatic" copiers have a number of disadvantages. The quality of reproduction is often poor, the feel is slightly unpleasant such that it is often suggested — by plain paper copier salesmen — that they can only be used internally within a company. The cost of the paper is significantly higher than that for plain paper copiers and they can only cope with fairly modest volumes of copies.

Withdrawals

It is generally acknowledged in the industry that the coated paper copier is at the end of its life with precious few new models in the last 18 months and several withdrawals from the market. Nevertheless, there is expected to be a demand at the low end of the range for a very cheap copier used only for small volumes.

Finally, there is the stencil duplicator—very cheap, even if slightly messy and troublesome — which has been long outstripped by the photocopier. The British company, Gestetner, still has a substantial proportion of its sales in stencil duplicators.

Although criticised for being slow to realise the impact of copiers on its business, Gestetner has been successfully selling a plain paper copier of its own for several years which is made by Rex Rotary, its Danish subsidiary acquired in 1976.

One of the results of the apparently never-ending plunge in copier prices is the forced changes in selling methods. While one day it may be economic to employ a salesman, complete with company car, driving round to clients the next day he has become the largest cost item in the product as the price tumbles.

It is a problem felt most keenly by Rank Xerox which grew with a monopoly in plain paper copiers and high prices. Faced with Japanese competition, using dealers' services instead of costly direct sales forces, Rank Xerox has had to reduce its own staff and find new ways of selling.

These include sales by telephone, setting up of retail stores (both in the U.S. and the UK) and even selling by mail order, which not so long ago would have been unthinkable.

One aspect of Japanese competition which cannot make the Xerox management sleep any easier is its gradual move up-market. Canon, for instance, has a copier in Japan which is faster than the top of the range Xerox although it is less sophisticated.

The market for copiers looks set to keep on going and customers can only welcome the fall in prices. Although the photocopier industry would appear to be doing nothing to help the much vaunted paperless office, there is a move towards "intelligent copiers," which can reproduce information stored in a computer or word-processor.

More lines & characters than Shakespeare.



Please tell me more about the Dictaphone Dual Display Word Processor. FT 13.4.82

Dictaphone Dual Display word processor

For a company with a Telex bill over £15,000. The message is clear.



You don't have to be a big user of telex to be able to cut your costs and improve your communications with a TELEX MANAGER. With prices from £8,500 it will pay for itself quicker than you dared to hope.

This is a new concept in telex. It means telexes can be sent and received anywhere in your organisation. Between departments. Or long distance. And all without any paper tape to jam or tear or get mixed up. It is so easy to use that no one need be frightened of sending a telex.

Telex messages are created at quiet, good looking display terminals with easy-to-read characters—a well known Ferranti feature. Text editing facilities make it easy to get the messages correct, and you can lay them out clearly so that they're easily understood.

You don't need to know how to dial busy lines. TELEX MANAGER looks after all that and makes the call as short as possible to save you costs, sorts out priorities—sends the most urgent messages first. It will send the same telex to many different places on one word from you.

As for incoming messages, they are accepted without interrupting the operation of the terminal, and can be sent straight to the department that wants them.

TELEX MANAGER is great for a busy telex system and can grow to offer all its advanced facilities to meet larger message switching applications.

Check your telex bill now and you'll get the message.

Please show me how I can cut the cost of telex with TELEX MANAGER

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TELEX MANAGER A new concept in telex

FERRANTI Computer Systems FT 134

OCRs and OMRs are now moving into new territory

Data processing developments

IN THE general data processing environment, if a printed typed document of some kind already exists and the computer needs it for some purpose, then there are basically two alternative procedures.

Either an operator sits at a keyboard, reads the material and keys it into the system or, what is more likely if the throughput justifies it, the system employs optical character recognition, OCR, to do the same job at much higher speeds.

For many years, OCR has figured mostly in banking and in particular to read the millions of cheques that have to be dealt with daily. But the advent of text processing in smaller business systems is bringing OCR into a different focus. In addition, a similar technique called optical mark recognition (OMR) has carved a market niche where it is cost effective to make simple, single line marks on a matrix form of some kind in order to record business data—stock levels for example.

Most of the major computer companies offer both financial document and page readers. Burroughs for example has a machine that can be loaded with up to 50 typed pages and will read them at the rate of 250/hour.

Increasingly such machines are able to recognise wider ranges of fonts (character sets). The Japanese company Totec has just launched in the UK a unit that can deal with OCR A and B (the original "computer" fonts) and several others as well including Courier 72, Prestige Elite 72, Courier 12 and Pica 72. Of desk top size, it costs under £7,000 and is being marketed by Mitsui Computer.

Such machines can overcome an important bottleneck in some word processing installations in which WP terminals can be tied up keying in long existing documents from other sources when they could be employed on the more suitable tasks of editing and formatting. They also mean that the office typewriters can become

input devices for the word processing system. This might well save some money since typewriters are a great deal cheaper than visual display terminals. Furthermore, the typist does not have to be the world's best because the WP terminal's screen can be used to correct errors or improve the format using the original author's marked up copy draft.

The word processing system operator is thus left free to edit quickly the copy on screen to meet the author's corrections and print out the finished copy for approval.

An interesting idea stemming from the word processing application is for the preparation of telex messages. There are already "electronic" ways of doing this and in any case new telex machines are coming on to the market for the purpose—using screen-based approaches. However, if the OCR reader is already in the office then, as with word processing, the message can be typed on an ordinary machine and fed into the OCR unit. It is technically only a short step to convert the result to telex code and the Mitsui machine will do this.

Characters scanned

Technically, the process of optically reading what is present on the surface of the paper is not too difficult, with modern electro-optics. In most cases arrays of tiny photocells are used to scan the characters line by line; changes from black to white at character edges become signals. The bigger problem is to determine, from the signals, what each character is.

Thus, early OCR could only cope with formalised characters of the kind seen at the bottom of cheques. But as processing power has become cheaper and software cleverer... ordinary printing fonts (for example, the Times Roman of this page) could be dealt with. Today, there are a number

of machines that can cope with hand-printed capital letters. At the moment, continuous band writing is too much even for the latest computers to convert to a reliable stream of digital signals.

But the two or three words of a signature can be recognised sufficiently to say that the signature does belong to the man who wrote it rather than a forger. Recognition in the case of a machine recently designed by Transaction Security of Guildford, is as much dependent on how the words are written as it is on what is written.

As the writer's pen moves, its position is digitised at frequent intervals. Not both the geometric and the rhythmic properties of the signature are extracted and reduced to a unique and personal sequence of numbers which can be encoded on to a say, a credit card or an identity card. Thus when the card owner is trying to obtain cash or get into premises, if the number derived from the on-the-spot signature does not tally with what is on the card, he can proceed no further.

In offices concerned with things like stock control, delivery schedules, quality control reports, sales orders or insurance premium collections, OMR has a lot to offer.

Instead of a keying operation using order forms, shop reports or other pieces of paper filled out at the source of the data, the originator of the data himself makes marks in boxes on a form that the computer can immediately read. The forms up to A4 in size, can be fed at about a yard a second into the computer, some 10,000 such documents an hour.

One of the UK's OMR proponents, Data and Research Services of Milton Keynes, says that the car industry has taken much interest in OMR. One big company asks its distributors to fill up such forms as official orders. They are sent through the post to the maker who, via the computers, is then

able to schedule manufacture more quickly. Another manufacturer uses them to collect quality control information from the shop floor.

Data Recognition is a leading UK OMR company and has, for example, provided equipment to food wholesalers who use the forms to collect orders. There is no doubt, however, that in terms of activity and capital expenditure on OCR equipment, the banks and other financial institutions are out in front.

Six passes

For many years the major banks have had sorting halls full of 20-pocket cheque sorters, allowing all the necessary sorting to be done overnight in as little as six passes. IBM, Burroughs, NCR and others are all involved and Britain's main maker in this field is OCR Scandata.

Scandata's latest offering is the 2280, an advanced machine that is able to scan documents like cheques at up to 30,000/hr and A4 pages of text at 4,000/hr. More documents can be loaded while the machine is scanning. Characters which fail to be recognised are handled simultaneously with the scanning by a special workstation which permits re-entry of non-recognised characters from a video image displayed on a VDU.

Most of these developments are concerned with cost effective high speed throughput. Recently machines have appeared that will process the "turn-around" payment documents used by the utilities, local authorities, insurance companies and others, at the same time on one machine—dubbed "one step remittance processing."

Interbank credits will probably also be dealt with by OCR and Scandata has already installed two machines for Barclays.

Geoffrey Charlish

How to maintain your reputation with no visible means of support.

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THE ELECTRONIC OFFICE XIV

Dramatic changes are under way in the U.S. computer industry

U.S. suppliers aim to put a computer on every desk

OFFICE AUTOMATION used to mean copiers, electric typewriters and a big computer hidden away in its own clean room.

Today, the picture is changing dramatically. The mainframe computer is being widely replaced—or supplemented—by a collection of smaller computers. Word processors are supplanting the old-fashioned typewriter, and printers, electronic filing systems and electronic mail systems and taking over the tasks of producing, storing and distributing documents. By the end of the 1980s, virtually all office workers, managers and executives will have access to computers. Industry estimates suggest that in the U.S. there will be approximately 10m desk-top computers by 1985, representing a total value of more than \$250n.

Like it or not, the "office of the future" is on its way and for many in the U.S. it has already arrived. The goal of U.S. office equipment suppliers is to put a computer on every desk, and nobody seems to doubt that it will do it.

The most important trend in office automation is towards distributed computing—groups of small computers, rather than a single centralised system. Microcomputers are becoming powerful enough to do many of the jobs that only the big mainframe systems could do before.

Built around microprocessors, these systems offer cheap computing power, so cheap, in fact that businesses are buying them in huge volumes. Sales of small computers—personal computers, word processors, desktop computers and minicomputers—will total some \$40bn by 1985, up from \$11bn in 1980.

The changing pattern of business computing will have enormous repercussions in the U.S. computer industry. Those that adapt will prosper, and those that do not are in for hard times, warn industry analysts.

Already, signs of the upset are emerging on the balance sheets of some of the best-known computer manufacturers. Examiners of major computer manufacturers such as Sperry, Burroughs and NCR have dramatically declined, and even IBM's growth rate has slowed down.

Minicomputer manufacturers such as Digital Equipment Corporation and Hewlett Packard have fared much better. HP entered the office computer market just a year ago with a series of products that support the concept of the "interactive office." This month HP will introduce in the U.S. an electronic mail system for users of its HP 3000 minicomputer.

HP mail will allow messages to be passed from one terminal to another around an office, or to another matching computer in a remote location.

But even the minicomputer makers are threatened by a new generation of microcomputer builders. Within three years, microcomputer-based systems that perform as well as or better than today's minicomputer will be available for one-fifth to one-tenth of the price, according to Gnostic Concepts, a California market study group.

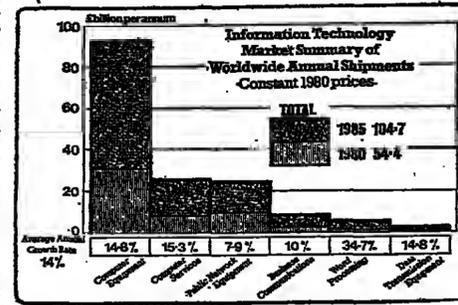
Minicomputer makers will be forced to move up to higher performance-level machines in order to survive, Gnostic pre-

THE GROWING U.S. MARKETS

Value of office automation equipment markets in \$m, based on shipments.

	1978	1979	1980	1981	1982	Average yearly % rate of change 1978-1982
Word processors	1,000	1,200	—	—	1,530	16.1
Small business computers	1,474	1,992	2,982	4,093	5,515	38.1
Desktop computers	486	868	1,169	1,609	2,045	43.2
Facsimile equipment	54	—	—	—	144	27.7
Total	3,014	—	—	—	9,534	33.4

Volume (1,000 units):	1978	1979	1980	1981	1982
Small business computers	47	63	93	129	170
Desktop computers	241	417	634	987	1,224



Professional workstations

Another important trend in the U.S. office automation market is towards including managers and professionals in the use of personal computers. Managers, it seems, are less ready, or able, to spend the time needed to learn how to use complicated word processing and data analysis programs than are their clerical helpers. Machines for professionals are therefore expected to incorporate highly advanced features that make them more "user friendly."

Among the first "executive workstations" on the market is the highly acclaimed Xerox "Star." This machine has a simple control mechanism called a mouse that can be moved around on the desk top to direct a pointer on the screen. The user selects the function he wants by pointing to one of a series of symbols on the screen and simply presses a button to make it happen.

Expected soon from Xerox and other manufacturers such as Apple and Digital Equipment Corporation are even smarter microcomputer systems that can carry on several tasks simultaneously.

He might, for example, point a file, enter information into a data base and receive electronic mail from a communications port, all at the same time.

Such systems, the manufacturers argue, increase the productivity of expensive managers and professionals.

The question remains whether they will be easily accepted. Some argue that managers do not want to learn how to type and will therefore shy away from keyboard machines. This may well be relevant in the UK, but is far less so in the U.S., where any college graduate will have picked up the skill.

Perhaps the biggest attraction of a personal computer for the professional will be its communications capabilities. Linked to a telephone line, the microcomputer becomes an electronic mailbox, capable of sending and receiving messages from the next office, or around the world.

In the end, it may come down to a question of which is the biggest status symbol—a secretary or a personal computer. There is no doubt that in the very near future, the computer will be cheaper.

Networking

Once the conversion to small desk top computers is accepted, then the next step is to make these machines talk to each other, and to allow them to share expensive peripheral devices like printers or large data storage systems.

The answer is the "local area network"—a cable connecting each of the pieces of computer equipment in an office building. To enable a diversity of machines to communicate with one another is a highly complex problem, and one that is occupying the energies of most U.S. computer manufacturers today.

Several different systems have been proposed by various companies. Leading the field are Xerox, with Ethernet, and Wang Laboratories with Wangnet. Each uses a totally different approach. Ethernet is a "baseband" system which uses a single channel to pass data from one machine to another.

Wangnet uses multiple channels but can handle video and voice communication as well as data communications. The proponents of each argue that theirs should become the industry standard.

So far, Ethernet, which is sponsored by Dec and Intel, as well as Xerox, has most support although a decision by the standards committee of the U.S. Institute of Electrical and Electronics Engineers to set a slightly different standard for local area networks has been a major blow for Ethernet causing companies such as Hewlett Packard to drop its support for the system.

IBM recently revealed that it, too, is soon to introduce a local area networking scheme.

At a technical conference in the U.S., IBM engineers described a baseband system that may be offered for linking IBM office equipment.

Some producers in the West face severe challenges

Japanese make rapid advances

DURING THE past five years, Japanese-made products have become an increasingly familiar sight in Western offices. Indeed, their penetration has increased so rapidly that Japanese manufacturers can now claim to dominate sales of some types of commonly-used equipment, particularly at the lower end of the price scale.

In low-cost copiers, for example, the traditional position of Xerox and its international subsidiary, Rank Xerox, has been under increasingly severe challenge from manufacturers like Oki, Canon and Ricoh. Canon already claims to have captured the biggest share of the U.S. market, where it is selling 100,000 machines a year.

The pattern has repeated itself in inexpensive computer printers, widely used for personal computers, with Japan holding an estimated 75 per cent of the American market. Japanese companies have won a similar share of U.S. sales of high-speed facsimile machines.

These trends have partly been encouraged by U.S. office equipment manufacturers. Unable or unwilling to produce themselves all the products which they want to sell, they have looked to the Japanese to supply them. Even International Business Machines, once firmly committed to selling only its own equipment, markets under its label copiers manufactured by Minolta.

Now many Japanese manufacturers are working on

strategies to link their products — which have been sold until now mostly for use as self-contained "stand-alone" machines — into integrated office systems. Using their Western customer bases and sales forces as a springboard, they aim to develop during this decade from manufacturers of office automation products into suppliers of communicating information processing equipment.

Several of the bigger companies already have many of the components needed. Fujitsu, Hitachi and Nippon Electric all have vertically-integrated product structures ranging from semiconductors to large computers, private branch exchanges (PBXs) and transmission equipment.

These companies have an advantage over their Western competitors, in that they combine technological skills in both computers and communications.

Nippon Electric has symbolised this strength in its slogan "C and C." It aims to be able to provide a comprehensive range of integrated systems to customers ranging from small companies with just one or two offices to huge organisations like railways or electricity supply companies which need to be able to channel vast quantities of information between many different locations.

Other companies are focusing their approach on a narrower target. Matsushita, best known

for consumer electronics, is developing integrated systems for handling graphics and text. They combine facsimile, copiers, small business computers and word processors.

Facsimile has been a popular means of transmitting written information in Japan, because it avoided the need to print out mechanically the kanji alphabet,

which consists of more than 10,000 intricate characters. Though Japanese typewriters exist, they are cumbersome to use and can master only a small fraction of the total number of kanji characters.

Nonetheless, kanji word processors have started to appear on the Japanese market and are reported to be selling reasonably well.

CONTINUED ON NEXT PAGE

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THE ELECTRONIC OFFICE XV

The Government is putting up half the money for the project, says Guy de Jonquieres

£1m drive to promote office technology



Mr Kenneth Baker, Britain's Minister for Information Technology, is launching a series of initiatives to encourage wider use of advanced equipment in commerce and industry

THIS YEAR an unsuspecting, and by all accounts largely ignorant, British public is being exposed to a film campaign intended to promote awareness of information technology. The Industry Department, which is putting up half the money, hopes the project will bring home the far-reaching implications of the convergence of computers and communications technology and the role of the ubiquitous microchip.

The campaign is one of a series of initiatives launched by Mr Kenneth Baker (the Department's energetic Minister for Information Technology), to stimulate users to install technologically advanced equipment and to encourage British manufacturers to develop and supply it.

There is certainly plenty of scope for more to be done in both areas. Precise information about the extent of office automation in Britain is scarce, but from the evidence available it appears that the UK lags behind some other industrialised countries, notably the U.S. and Japan.

A study published last year by Industrial Market Research found that only 3 per cent of business and government establishments used word processors, 9 per cent had computers and 2 per cent facsimile machines. Moreover, much of the more sophisticated equipment was concentrated in bigger establishments.

Another survey, carried out by the Marketing Department of the University of Lancaster,

found that only one in 10 small businesses (defined as those employing less than 200 people) uses a microcomputer. Usage was found to be markedly higher in service industries than among manufacturing companies.

Central Government itself is a prime candidate for office automation. But equipment like word processors has been introduced only on a limited basis—and then often only on trial—in Whitehall. Reaching agreement with the main civil service unions on the wider use of new office technology has required protracted and difficult negotiations.

The number of government initiatives aimed specifically at stimulating greater public interest in office automation is relatively small. They include the sponsorship of pilot electronic office installations—one of them in the Cabinet Office—a programme to monitor office system trials and several spearhead projects being carried out to test the application of innovative technology. One of these is a trial of a system which allows direct handwritten input into a machine.

It is hoped that the spread of office technology will also be accelerated by a number of other Industry Department programmes. These include setting up technology centres to train school-leavers in computer techniques, installing microcomputers in schools and support for the promotion of

Viewdata and Teletext.

Undoubtedly the most far-reaching measure which the Government has taken so far, however, is the liberalisation of the telecommunications industry. It hopes that by relaxing British Telecom's traditional monopoly and allowing private suppliers to compete, it will encourage the commercial introduction of a wide range of innovative products and services.

Far-reaching

The major beneficiaries of the new policy, which was set in motion last October, are expected to be business users—for the foreseeable future at least. Not only do their requirements for sophisticated services far exceed those of the ordinary household, but they are also able to pay more for them.

A consortium formed by Cable and Wireless, Barclays Merchant Bank and British Petroleum has started work on an independent communications system, Mercury, which aims to compete with British Telecom in providing premium communications to large companies. Mercury will enter operation in the City of London later this year and spread to the rest of the country by 1984.

As well as voice, Mercury plans to carry high-speed data communications and video conferencing. The challenge has stung British Telecom into action. It has recently accelerated the modernisation of its national network, introduced new digital circuits and launched services like electronic mail. It also plans to start direct satellite communications in about two years' time.

But how much of the future demand for electronic office systems and products will be met by British suppliers? A somewhat gloomy prognosis was offered last August in a study carried out by the Pactal consultancy at the request of the National Enterprise Board, part of the British Technology Group.

The report forecast a doubling of the world market for information technology products to £105bn between 1980 and 1985. But it warned that Britain, which accounts for six per cent of the total, was supplying only 50 per cent of its own needs. By 1990 the proportion would fall to 35 per cent, producing a trade deficit of £1bn up from £300m in 1980.

The report said that British industry was weak in many of the key elements of office automation such as production of

word processors and copiers and accused supplier companies of taking too complacent a view of foreign competition, particularly Japan. There were scarcely any British-owned companies with the aggressiveness, international marketing capacity and high profitability needed to make a real dent on the world market.

The difficulties which can beset an attempt to break into the office automation market were underlined late last year by the collapse of Nexos. The company had been set up by the NEB three years before to supply a range of advanced office systems. But it never managed to establish itself, in spite of investments by the NEB totalling £30m.

Some critics have argued that Nexos set its sights too high in the first place. It was aiming to supply technologically sophisticated and often untested equipment in competition with powerful giants like IBM and Xerox. One of its more glamorous products was an immensely powerful computer developed by an affiliate of Exxon of the U.S., which Nexos wanted to use as the nerve centre of an integrated office. But it never took a single order.

Nexos was also a victim of bad luck. It was dogged by

delays in the production of a word processor designed for it by Logica, a leading British computer systems house. By the time the machine became available other manufacturers had cut their prices sharply and the hoped-for manufacturing and sales volumes were not achieved.

Outbid by ICL

Last summer the NEB opened negotiations with Gestetner, the British copier/duplicator group, which was interested in acquiring rights to the word processor. Gestetner saw this as a way to move into electronic systems from its base in older, mechanical technology. But it was outbid at the last minute by ICL, Britain's biggest computer manufacturer, which also needed a word processor to flesh out its product line.

The improvement in ICL's fortunes over the past year has been one of the brighter spots in Britain's high-technology industry. After hovering on the brink of financial collapse for several months, it has embarked on an energetic recovery programme under the new management installed last May.

As well as retaining ICL's

traditional commitment to big computers Mr Robb Wilmot, its new managing director, aims to expand significantly its role in the office automation market. His strategy is based on the principle of a fully "networked" product line in which all equipment, from small desktop terminals to large mainframe computers will be designed to communicate electronically.

But to secure access to the necessary products quickly and at the least possible development costs, ICL has had to look to deals with several other companies, mainly overseas. These included an agreement under which Fujitsu of Japan will supply ICL with chip technology and very big computers which compete directly with IBM machines.

ICL has also reached agreements with Mitel of Canada, to

market a private branch exchange (PBX), with Three Rivers of the U.S. to make and sell a powerful professional microcomputer; with Sinclair of the UK to develop an inexpensive desktop workstation and with RAI, also a British company, to produce a personal computer.

A number of other British-owned companies have recently taken steps to increase their involvement in the supply of office systems. They include Plessey, which is marketing a system designed around the PBX which it manufactures under licence from Rolm of the U.S.; the General Electric Company, which is setting up a new office systems division; and Ferranti, which has established a joint venture with General Telephone of the U.S. to make telecommunications equipment in Britain.

JAPANESE MANUFACTURERS

The five leading manufacturers of office automation equipment in Japan account for about 40 per cent of the national production, so that the degree of concentration is relatively low.

Key: † production; ‡ sales only; * production in preparation

	Facsimile equipment	Office computers	Personal computers	Japanese word processors
Integrated electrical machinery manufacturers:				
Hitachi Ltd.	†	†	†	†
Toshiba	†	†	†	†
Mitsubishi Electric	†	†	†	†
Communications equipment manufacturers:				
Nippon Electric	†	†	†	†
Fujitsu	†	†	†	†
Oki Electric	†	†	†	†
Home appliances manufacturers:				
Matsushita group	†	†	†	†
Sharp	†	†	†	†
Sanyo Electric	†	†	†	†
Office equipment manufacturers:				
Ricoh	†	†	†	†
Canon	†	†	†	†
Casio Computer	†	†	†	†
Subsidiaries of foreign enterprises:				
Nippon Univac	†	†	†	†
Nippon NEC	†	†	†	†
Nippon Olivetti	†	†	†	†

Source: Fuji Bank Bulletin, 1982.

Rapid advances

CONTINUED FROM PREVIOUS PAGE

ably well. Though Western companies still have much more experience in designing word processors, some Japanese manufacturers believe that the research needed to overcome the complexities of their own national language will enable them to develop still more advanced machines for markets in the U.S. and Europe.

Japan is also devoting a considerable effort to research and development on systems which can recognise patterns and respond to spoken instructions. Several companies are already marketing devices which can identify a limited range of commands spoken by a number of different people or a wider vocabulary spoken by one individual. The machines are used for tasks like checking inventories and sorting mail.

The Ministry of International Trade and Industry hopes to give research in these fields a major boost through its programme to develop a Fifth Generation Computer. The 10-year project is intended to result in a prototype machine which can be easily used by untrained operators and will have limited powers of reasoning.

Collaboration

The Ministry, which will conduct the project in close collaboration with a group of Japanese electronics companies, believes that it will open the way for a new generation of machines which can carry out medical consultations, perform automatic language translations and print out dictated text. Though some Western experts doubt whether these goals can be achieved in the 10 years envisaged, many think that Japan will gain much useful experience in the process.

Japanese industry's proven success in volume manufacturing of keenly-priced office products will be a powerful advantage in its strategy to graduate towards more complex information systems. But it must also overcome some important handicaps if it is to compete effectively on international markets against such giants as IBM, Xerox and American Telephone and

Telegraph. One of these is that domestic demand in Japan for sophisticated office integration is developing relatively slowly. Indeed, the pattern of work in most Japanese offices is very different from those in the West.

Because of the complexities of the kanji alphabet, for example, printed or type-written correspondence is rare. Even in big companies, most internal memoranda are written out long-hand and photo-copied if more than one copy is needed.

But successful integrated information systems will be built around software, or programming, which closely reflects the requirements of users. To try to meet this requirement, many Japanese companies are stepping up sharply recruitment of programmers and systems designers and in some cases are setting up their own software centres in the west.

Another hurdle is distribution and maintenance. Though Japanese manufacturers have been immensely successful at marketing lower-price products internationally, the distribution channels which they use often vary from product to product.

With stand-alone equipment, sold on a one-off basis, this does not matter. But customers investing in integrated systems will want to be able to procure all their needs from a single source.

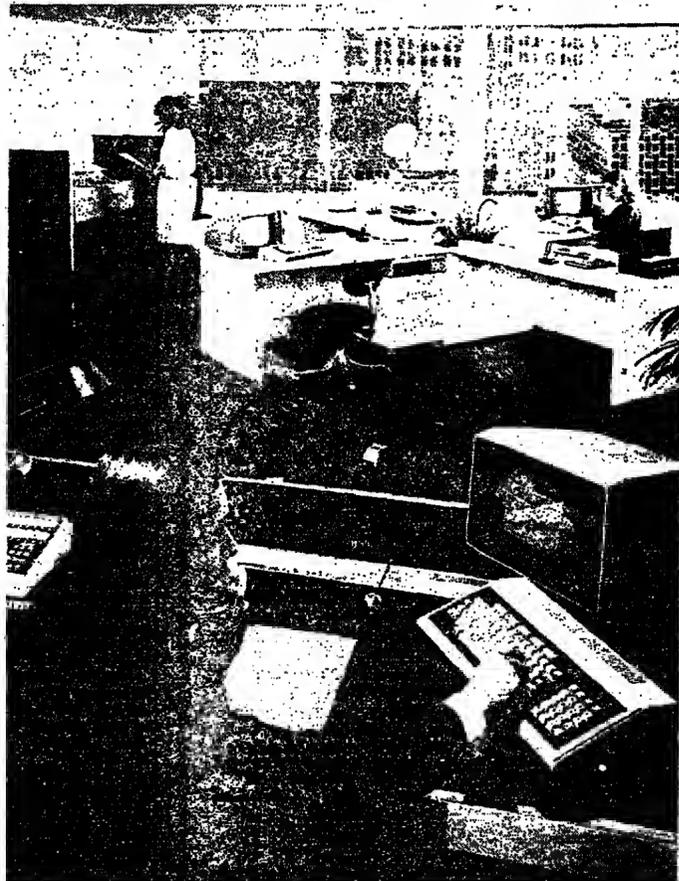
Equally, large systems will require many more highly-skilled engineers to service and maintain them. That will mean making a substantial investment in manpower if Japan's reputation for efficiency and reliability in less expensive equipment is to be retained in the fully electronic office of the future.

Japanese companies already possess most of the building blocks needed to construct a highly competitive strategy for the integrated office of the future. It should become clear within the next few years how adept they are at designing the architecture and making the cement which will bind the whole edifice together.

Guy de Jonquieres

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THE ELECTRONIC OFFICE XVI

Office products, business systems and telecommunications

Olivetti's three routes to office automation

"THE OFFICE of the future is the office of the present. There is not going to be a revolution when the customer suddenly throws everything he's got out of the window and orders a fresh—the customer will arrive at the automated office by a process of evolution."

This is the view of Sig Franco Agostinucci, manager of Olivetti's word processing and office automation division. In the past six months Olivetti has begun installing fully automated offices for a number of large Italian concerns, including Fiat—webs of minicomputers, electronic typewriters, word processors, terminals and telecommunications equipment. But despite its novelty the automated office is inevitably just the culmination of past developments. Olivetti is the biggest maker of office and data processing equipment in Europe and the sixth biggest in the world. Through it is one of the leading private sector companies in Italy, only about 35 per cent of its group turnover (which in 1981 reached L2,877m—\$2.2bn) arises in Italy, and nearly half its 53,000 employees work outside Italy.

Traditionally, Olivetti has been known for its typewriters and other office equipment, though it has long been involved in data processing and until the early 1980s was making large computers. But in the past few years its processes have been at work: first, sales of Olivetti's data processing equipment—which include word processors, personal minicomputers, accounting and business systems, telecommunications equipment and terminals—have expanded so that in 1980 they accounted for well over half group turnover.

The first Secondly, Olivetti was the first company in the world to introduce the electronic typewriter, which in 1980 accounted for 8 per cent of group sales. The result is that Olivetti's gap between office and data processing equipment is becoming more blurred, and another consequence is that the traditional mechanical or electro-mechanical Olivetti typewriters will gradually go out of production, as they already have in some plants. Through in 1980 they still accounted for a robust 24 per cent of group sales the fact that they have about ten times as many parts as electronic machines makes them far cheaper to manufacture in terms of manpower. Because of its strength in data processing and business systems, Olivetti is in a far stronger position to compete in

GROUP PRODUCTS

Information processing	per cent
Word processing systems	5.3
Personal minicomputer	3.5
Accounting and business systems	23.1
Telecommunications equipment	6.0
Terminal and data entry systems	16.3
Total	54.2
Electronic typewriters	8.3
Office products	
Typewriters	24.0
Calculators	7.2
Cash registers	0.4
Copiers	4.5
Office furniture	1.4
Total	37.5
Grand total	100.0

modern office automation than other European office equipment makers like Triumph Adler and Olympia. Instead, its rivals are other data processing equipment makers (IBM with its strong presence in office products as well as an obvious one) and lately the big telecommunications companies, as well.

For the dividing lines between machines for office, data processing and telecommunications use are becoming blurred and the machines themselves can increasingly be used for more than one function. Since many of the components are the same, the real competition between the office automation companies is in such things as devising the most convenient links (or interfaces) between the different components, and making the machines easy and pleasant to use.

At least in Italy, Olivetti claims to be able to approach office automation from all three poles—from its bases in office products, data processing, as well as telecommunications. "It's difficult to sell the global system approach," says Sig Agostinucci, "it's better to build what the customer already has. The large customer who wants to buy new equipment will know all about office automation and what the office of the future is all about."

In most world markets — Olivetti's strengths are in Europe, Latin America, Australia and so on — Olivetti starts from the office equipment base. It envisages building up systems commencing with the electronic typewriter, ascending through many electronic typewriters to display word processors, and on via communications systems to electronic storage and clusters of terminals.

The heart of the system would ultimately be a minicomputer (magnetic storage), with a voice

PBX to handle access to it by users.

A secretary sitting at her electronic typewriter can ask the computer what electronic mail there is for her that day, and the computer can then send her the messages in the order she wants them. She can also patch a telex message to another company ordering, say, spare parts going via the voice private business exchange (PBX) and minicomputer to the telex machines, and the computer will simultaneously store her request and send a copy of it to the company purchasing department.

The data processing approach applies particularly to organisations like banks which already have Olivetti business systems. It is rather the reverse of the office equipment approach.

The starting point is more likely to be a computer and related terminals, to which are now to be appended word processors and electronic typewriters, and so on. Olivetti is strong in bank automation—systems that conduct the counter (automatic teller machines) with the back office functions. As well as its home base of Italy, where about three-quarters of all automated banks have Olivetti terminals, the Italian company has a strong presence in Australia, in the Japanese rural bank sector (recently in Deomark and elsewhere).

Strong sales

Olivetti has not traditionally been very strong in telecommunications, which accounted for only 6 per cent of group sales in 1980. It makes teleprinters and message switching equipment, for both of which it has strong sales in Italy and in certain other countries, like Austria and some states in the Middle East. It also sells voice private business exchanges (PBX) under licence from Northern Telecom and is to start manufacturing them under licence.

Only in Italy can it start from the telecommunications base: in other countries it has come up against the fact that most states tend to favour domestic manufacturers for telecommunications equipment and PTT companies, while even in Italy the future structure of the telecommunications industry and the systems have yet to be finalised.

Nevertheless, Olivetti is developing a teletext machine, for the new advanced system the lines for which are being installed in several European countries. The introduction of teletext will allow machines like word processors and electronic

typewriters to be connected to machines in other places without going through the medium of a telex — thus giving the modern office instant telecommunications.

For small companies employing 100 people or so, Olivetti's approach is most likely to be via the business system, which may already have installed a computer for handling payroll and other administrative matters. This is one of Olivetti's stronger fields. In view of its absence until recently from the large computer market (it now sells such machines under licence), it can build onto the base of small business computer by installing multiple keyboard machines for data entry and access mail, and so on.

The story of Olivetti's recovery from being an unprofitable, overstaffed and heavily indebted company in the second half of the 1970s to the leaner, profitable and almost negligible indebted company of today is becoming well known as a textbook for the recovery of the large Italian company.

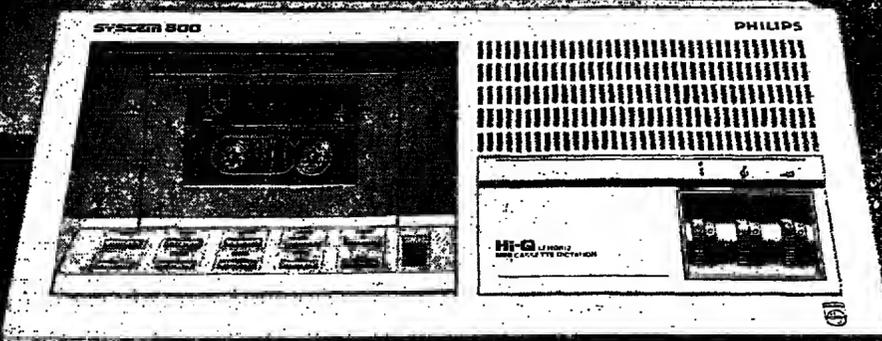
It was due to the arrival of Six Carlo de Benedetti as chief executive in 1978, the changes he pushed through and the coincidence of the fact that the company was then ready to launch its electronic typewriter, whose sales have grown so fast (in the first half of 1981 they amounted to 20 per cent of the turnover of the more electronically oriented parent company, Inz. C. Olivetti).

The parent company in 1981 made profits of Lire 87,800 on turnover of Lire 1,362bn, a profit increase of 75 per cent. The other aspect of its growth has been a steady series of acquisitions both in the U.S. and Europe. In 1981, Olivetti took a controlling stake in Hermes, the Swiss office equipment maker, and in West German subsidiary, Data Terminal Systems, which contributed to group sales in the second half of last year. It also took a 23 per cent stake in Docutel, the U.S. manufacturer of automatic teller machines for banks, and in Syntrex, a U.S. word processing machine maker.

Olivetti is making use of Docutel Olivetti to penetrate the U.S. ATM market—the U.S. market in general has been disappointing for Olivetti in the past 20 years. Another aim of this and other acquisitions of small companies is to obtain rapid access to know-how which it would take a year or two to acquire on its own. The policy is considered essential to maintain a technological lead in many fields in a constantly changing business.

James Buxton

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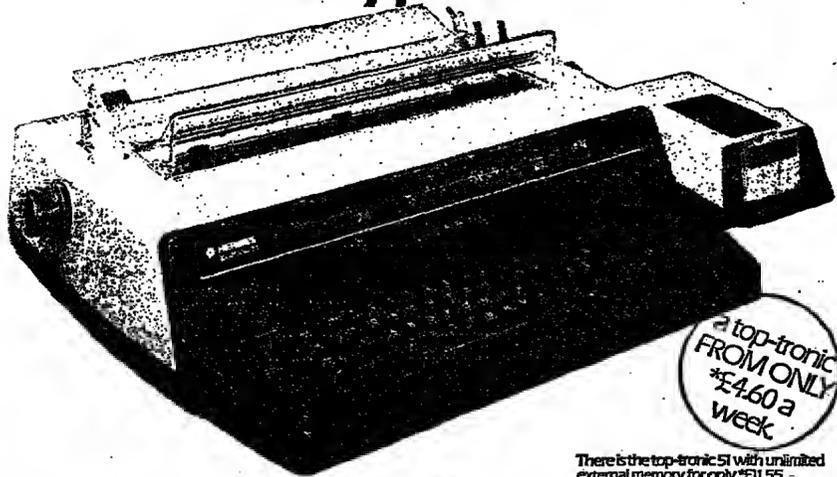
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Yet both of these examples fall outside the mainstream of the French strategy. In three other big companies—CIT-Alcatel, Thomson-CSF and Jeumont Schneider—this is based on a controlled expansion from their base in telephone switching systems.

In this field, at least, French industry has a leading position in its home market and is reckoned to have the technological strength to carve out a healthy share of world sales. The basic concept of all these companies is therefore to add a range of compatible peripherals around their private telephone exchange systems.

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Industry is now showing willingness to accept change France strives to catch up

FEW SUBJECTS have generated much paper in France over the past few years as the notion of the paperless, all-electronic office. But according to most market studies, the country remains slightly behind most of its Western partners in the application of these systems, firmly wedded to the red tape that has given French bureaucracy such a fearsome reputation.

This tardiness in accepting change has, until now, tended to count against French industry. In virtually all the main sectors of this extremely fragmented market, France is reckoned to run a balance of payments deficit. Hence the concern of successive French governments to galvanise industry into action — an attitude which began to produce results in the latter days of the last administration.

The outstanding example of this change was the move by Cit Honeywell Bull, the Franco-American computer group, and Olivetti, the Italian typewriter company. Saint Gobain's idea was to form a broadly-based office equipment supplier which would draw strength both from Olivetti's know-how in word processing production and from Cit's computer-based office peripherals systems.

Matra, the missiles and high technology group, has similarly tried to build on its competence in using micro-circuitry to move into terminal equipment manufacturing.

Yet both of these examples fall outside the mainstream of the French strategy. In three other big companies—CIT-Alcatel, Thomson-CSF and Jeumont Schneider—this is based on a controlled expansion from their base in telephone switching systems. In this field, at least, French industry has a leading position in its home market and is reckoned to have the technological strength to carve out a healthy share of world sales. The basic concept of all these companies is therefore to add a range of compatible peripherals around their private telephone exchange systems.

Once the company has won an order for the switching apparatus, it is argued, it has the base on which to sell the rest of its range, from screens, to memories, to copiers.

Not all these companies have the full range of peripheral materials, though one of the objectives is to be able to marry different equipment through the switching system.

CIT-Alcatel has probably gone the furthest with this process, developing a range of information screens, keyboards, telecopiers, and facsimile machines to go with its private exchanges. It has moved into the so-called "back office" activities through the takeover of Friden, the automated mailing concern in the U.S., expanding its international base through the acquisition of Roneo in the UK. The company believes the latter deal is particularly important in giving it the commercial network which is a highly significant, but often overlooked, part of the office equipment industry, particularly on the servicing side.

20% of market

Thomson's development is particularly based on integrated and interlinked information systems, spreading out from its switching systems into a range of mini-computers and office terminals. A terminal has been developed and already sold overseas, through a 35,000 order to GTE of the U.S., and it is also marketing a facsimile machine. In France it reckons to have about 20 per cent of the market in the mini-computer field.

Similarly, Jeumont Schneider, a subsidiary of the Empein Schneider group, has branched out from its private exchange technology, where it is reckoned to be virtually as strong as CIT in the French market, through the takeover of SECIE in the word processing and telecopier field. Despite these developments, however, the fact remains that the French market for most electronic office products is still heavily dominated by foreign companies. For examples, in the copier field, there is no significant French manufacturer among

the top six according to a recent study. The plain paper copier market, reckoned to be worth a total of about FFr 1.7bn (\$694m) in 1980, was dominated by Rank Xerox (FFr 2bn), followed by Gestetner, 3M, IBM, Nashua and Canon. One of the newer entrants, Minolta of Japan, is making great strides in the ordinary paper photocopying field, which is expected to grow by 72 per cent in the four years from 1980. In that year the number of installations reached 160,000, against a total of almost 400,000 copiers of all types.

In a similar way, the typewriter market, evolving with the change to electronic machines and word processors, is heavily dominated by foreign companies. Out of a total typewriter market of 2m units in 1980, worth about FFr 1.6bn about 64 per cent were reckoned to be electronic. At the same time, the electronic revolution is still only beginning, with 15,000 electronic machines in 1980, and 19,000 word processors—of which Olivetti, IBM and Cit-Honeywell Bull took the lion's share.

The new typewriting systems are however, reaching takeover point in the French market. According to recent studies, the installed number of word processors should quadruple over the next five years. The main success of domestic French manufacturers has been in the telex market, where the country runs a balance of payments surplus, reckoned to amount to about FFr 100m in 1980. The strength of the telex industry is based mainly on Sagem, with diversified interests in navigation and information systems. Sagem is reckoned to hold about 20 per cent of the world telex market, followed by Sintra, a subsidiary of the CIT-Alcatel group.

Despite French industry's relatively strong position in this sector, the telex has not penetrated the market to any great depth. It is reckoned that there are only about 100,000 installed machines in the country. Similarly, telecopiers, generating a turnover of around FFr 33m in 1980, are still not widely used. The estimated installations in 1980

totalled about 6,000, although it is reckoned this could grow to some 21,000 within two years. Some experts believe the telecopier market will remain a specialist field, although at one time it was regarded as a cheap and easy means of sending letters.

A much larger long-term market is likely to develop in the field of electronic filing and information storage. French manufacturers are beginning to develop systems for dealing with this problem, which is reckoned to take up about 9 per cent of the working day of the average French office worker, but again it is a field that is largely controlled by foreign companies. At present fewer than a million of France's 6m office workers have access to microfilm or magnetic storage facilities. But the development of the market is expected to step up sales from about FFr 350m in 1980 to FFr 900m in 1985.

A question

The overall value of the French market for the various types of office automation equipment remains a question of considerable argument between specialists—estimates vary between FFr 3.4bn in 1984 and FFr 8.5bn in 1985. What they are all agreed on is that it will remain one of the least developed markets in Europe despite a boom in the text preparation segment. France is expected to account for only 17 per cent of European sales, against 19.5 per cent in the UK and 25 per cent in West Germany in three years' time.

Against this background, the new Socialist Government is expected to continue with its selective research aid programme inherited from the previous administration. But it is not yet clear exactly where the money will go. Virtually all the leading companies in this sector — including Olivetti through its connection with Saint Gobain — are linked with the nationalised groups in one way or another. Hence the development of France's "bureautique" industry will to some extent depend on decisions taken about the organisation of the State sector.

Terry Dodsworth

THE ELECTRONIC OFFICE XVII

Michael Dixon highlights the complexities of teaching new skills in the computerised office

Important aspects of staff training

OF THE VARIOUS human habits liable to be rudely shaken by the advance of technology, perhaps the least noticed is our attitude to learning and knowledge.

For centuries most people have been led to believe that there exists a minority of sages—priests, scholars and then scientists—possessing deep theoretical knowledge covering all important aspects of life.

Since the 1960s at least, the sages have been seen increasingly to have feet of clay. Few managers believe any longer that there are theories of management which can be learned and applied systematically and effectively.

The undermining of the past two decades looks likely to be turned into large-scale demolition by the development of the so-called electronic office and its repercussions on the majority of working lives.

systems and the like, there is no theory to tell us how to use them sensibly.

How best to introduce and apply these theories can be decided only by the particular organisation concerned. Since that is true of the equipment available now, it cannot be less true of the unforeseeable advances which will be on the market in 1992.

Introducing an electronic system into an office is a bit like sending everyone working there to a different company where they will need to learn how to behave appropriately in new conditions and with changed human relationships.

In the absence of any theoretical short cut to learning how to do that, the only course is to grow accustomed to the strange, multi-skilled but neonomic newcomer and find out how to get on with it by practice.

Managers and staff have to evolve their system of working as they go along, which means continuously observing what is happening, reviewing it critically, and changing their behaviour accordingly. What will make the difference between success and failure is still intelligence, but practical intelligence rather than the intellectual kind.

planning or of memorising instructions are unimportant.

A bit of forethought however liable to error, can save a lot of anguish especially if it enables most of the staff savings permitted by the system to be made gradually by natural wastage.

Presentations to and discussions with staff intended to give them a broad appreciation

tests beforehand and at regular intervals thereafter.

Even a "teping pool" staff spend only 35 to 40 per cent of the time watching screens, and one group's training manager responds to the eyesight objection by asking if the person making it is similarly worried about the effects of watching television.

Forethought is at least as

schools which train people in keyboard skills.

At the same time staff formerly engaged almost entirely in secretarial work tend to become more involved in analytical tasks on their manager's behalf. They need, perhaps, to know how to write a programme to produce specific kinds of result, which in turn increases the importance among office workers of the intellectual skill of deciding what information needs to and can be called out of the electronic entrails.

A further tendency which it is wise to consider early is for younger staff to learn the new tricks more readily than their elders. Left just to happen, the result can be confusion and ill feeling in offices whose staff speaking orders formerly gave pride of place to the competence gained by age and experience.

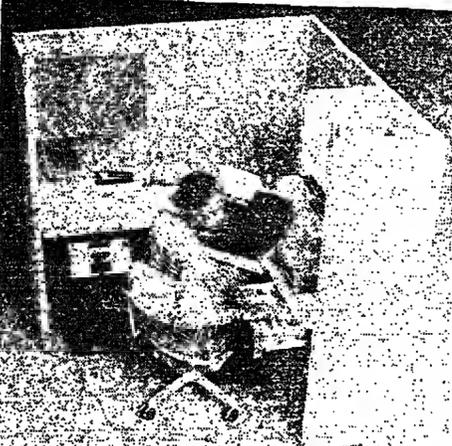
For staff who will mainly be operating the system, there are numerous introductory courses available on the market. They usually last about three days, and can vary in price from around £250 to £500. But after the course, it is rare for anyone to become proficient in using the new system without practising on it for six months or so, especially if it includes complexities such as shared logic. Learning by doing in this way

is, of course, more effective if conducted under the guidance of someone else already more proficient. But when a system is first introduced, the problem is that everyone in the office is a beginner.

The best way of overcoming the difficult seems to be to make use of the staff who grasp the techniques most quickly in the role of supporting consultants to their colleagues who are relatively struggling.

There is absolutely no substitute for co-operative learning by intelligent practice and, eventually, the progress of systems and productive cooperation among employees are increased by preparing the ground for it in advance.

Where forethought is at the greatest, however, however, is surely at the level of government. The development of the electronic office has ramifications spreading far beyond the employing organisations where it makes its direct impact. Just as the need for advanced people to do traditional clerical and secretarial jobs is eroded, so the need for a large number of new possibilities and skills in the future situation will be broadened in the direction of knowledge which the advance implies.



A Westinghouse open office word processing workstation. The total UK office furniture market is now worth £37m.

Manufacturers of specialised furniture systems for the electronic office reach a turning point.

Workstations of the future

WHILE the major focus of the office of the 1980s continues to be the advances in technology, many office furniture manufacturers are bemoaning the fact that their products are too often the Cinderella items of the office.

There are fresh indications, however, that suppliers—particularly in the £37m systems furniture market—are uniting to create greater market awareness of furniture for the electronic workstation.

The National Business Equipment Survey says that united efforts by furniture suppliers in the past year suggest that a turning point has been reached, with individual companies "combining muscle to make joint (as well as individual) impact."

These events include "Designers Saturday" in London, the setting up of the Contract Design Association, and the coming "Workspace 82" by G.A. Harvey, for example, is about to spend £250,000 on promoting its System One range, to be officially launched in June.

Mr John Sidwell, Harvey's managing director, says the company is "moving into a very professional area and our aim is to create a strong identity for Harvey end-users and architects."

Steelcase Strafor—the largest furniture manufacturer in the U.S., although a relative newcomer to the UK market—is doubling its p.r. investment and adopting a broad-based approach in terms of targets this year.

The company will soon be launching several additions to its Series 9000 system, including a new European-designed and developed work-surface, as well as a wide range of electronic information workstations, to be marketed as Ultronic.

Major efforts A number of British manufacturers are meanwhile making determined efforts to introduce new office systems specifically designed to meet the demands of the electronic office—for example, Lucas Furniture Systems of London with its recently launched Programme Two range.

Jan Davis of the National Business Equipment Survey says that systems suppliers (the larger, as well as the smaller) are also expanding the focus of their attention to include medium-sized contracts of 20 to 25 work-stations.

The increasing maturity and growing competition of the systems market should make such a development both expected and welcome.

Herman Miller, which leads the field with a 32 per cent share of the UK market, is among those companies which may even be extending the systems furniture concept outside the office environment—the company has introduced its "Action Factory" plan for light assembly engineering situations, mainly aiming for computer manufacturing groups.

Wang, for example, has installed around 150 Action Factory work-stations in their Southern Ireland base; and IBM are currently testing an Action Factory workstation in a variety of manufacturing situations.

Despite all the advances in information technology the average office environment in Britain is sadly lacking in overall design-function requirements.

While suppliers vie with each other to sell their concept of the electronic office, some leading office planners question how ready the European market is for these advanced products.

Mr Roger Henderson, of Space Planning Services, suggests that, in reality, the truly automated

Michael Wiltshire

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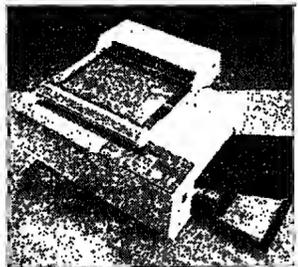
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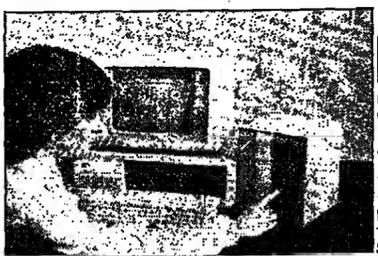
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THE ELECTRONIC OFFICE XVIII

Survey of user-attitudes among smaller companies

Many potential buyers confused by manufacturers' jargon

ALTHOUGH MANY manufacturers are strongly promoting the concept of the fully-integrated electronic office, it appears from a new survey that many smaller to medium-sized companies in the UK still have serious doubts about the desirability and viability of such systems.

Furthermore, a large number of companies perceive individual items, such as electronic typewriters, word-processors and mini-micro computers, as "an electronic office," says the National Business Equipment Survey. In a review of the attitudes among users and potential users.

The manufacturers' concept of the electronic office is not the same as the perception currently held by end-users, according to Mr Gavin Evans, of NBES. The market-place is all too often confused by manufacturers' jargon and technology issues.

Sixty-two per cent of small establishments employing less than 50 people have expressed doubts as to the value of full utilisation of an electronic office system where machines can communicate with each other.

Another major constraint for these companies is the capital cost related to new methods, as well as other hidden costs. In other words, the majority of potential users in the small

establishment sectors have serious doubts related to the cost/benefit ratio.

The survey also highlights expenditure priorities in terms of product groups. In the context of the electronic office, end-users are likely to concentrate major expenditure on the following items:

Computers	5%
Wordprocessors	22
Electronic typewriters	9
VDU/Printer terminal	10
Telecommunications, including telex	7
Facsimile	4
Microfilm	2

Meanwhile, 34 per cent of respondents had no plans to introduce additional items of technology.

With the exception of the larger office establishments, the concept of the fully-integrated office system has yet to be absorbed and comprehended by the marketplace and has therefore failed to catch the imagination of the vast majority so far.

This has been confirmed by the attitudes of end-users towards the electronic office and their familiarity with marketing jargon commonly associated with the installation of an office system. When the National Business Equipment Survey investigated respondents' familiarity with such phrases, the following response levels were recorded:

Data-base management	5%
Integrated network	45
Local area network	52
Distributed processing	38
System network architecture	18
Ethernet	22

(These figures add up to more than 100% because of multiple response.)

It is interesting to note, notwithstanding the vast amount of educational campaigning which has gone into promoting "local area network" and "Ethernet," that the awareness of Ethernet was only 22%.

Manufacturers themselves are guilty of confusing the marketplace/potential users with jargon and with technology issues. A large number of end-users, both in large and small companies, need assistance in terms of practical help so that they can appreciate the application of office automation.

Large establishments, such as banks, insurance companies and local authorities, express the view that future problems will be related to the integration of hardware and software for multiple vendors and suppliers.

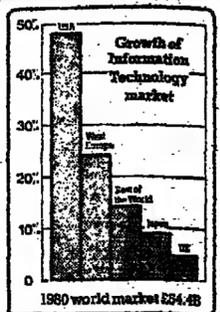
The overall impression from the NBES survey is that some

large companies see redundancy as a major problem. However, this view is not entirely shared by medium/small sized companies employing under 100 people who think that new technology will increase productivity and profitability and thereby avoid redundancies, and in the long run will even help to invest more money in the business and provide more opportunities for the workforce and in some cases higher employment.

Another area highlighted in the survey is that of personnel relations between staff and management: the general view in large establishments employing around 500 people is that staff relations during the transition to the electronic office are a key issue.

The problem of harmonising people to "make it work" is an important factor and people should be made aware of the potentialities of the technology so that they may appreciate that they themselves will be capable of capitalising from them.

Michael Wiltshire



THE DEPARTMENT of Industry has estimated that more than 50 per cent of British companies are still not using microelectronics or information technology in any way—and most people outside the industry still have little idea what it is all about.

For Information Technology Year, the nationwide awareness campaign, Mr Kenneth Baker, the Minister for Information Technology, has committed up to £500,000 towards funding the year.

Meanwhile, the Government has set aside £80m over the next four years to help British industry to research and develop innovative products and processes needed to increase the UK share of the market.

Details of the campaign—and the prospects for British equipment suppliers—are highlighted on Page XV.

How Mullard used technology at the heart of its own business to cut down waste

Reducing the paperwork



The Xionic system is being used at BP Oil by managers at several levels. Secretaries can also use it to store files, send electronic mail, provide word processing and personal computing facilities

Local area networks deal with Xionics

BP plays the guinea pig

WHEN Mr Mike Bevan, chairman of Xionics, wanted to develop an office automation system, based on the concept of local area networks, he managed to persuade British Petroleum to act as a guinea pig and help guide the design.

Since then, the Xibus system has been chosen to automate the Cabinet Office in Whitehall during this year of Information Technology and has secured business from other large organisations such as ICI, Scottish Gas, Allied Breweries and Littlewoods.

The principle of office automation, using a local area network, is simple. All the electronic office equipment—from word processors to telex machines—are connected with a loop of cable which is wired around the building.

It's akin to the electricity main in every home into which we plug household appliances; instead of carrying power, the loop carries information from one piece of office equipment to another.

Xionics has developed an "open system" which means that a company can connect office equipment belonging to a number of different manufacturers. This means that companies are not tied to one maker's equipment once the local area network is installed.

large systems need a measure of control which can only be obtained with a computer.

The BP system is used by managers at several levels and by secretaries to store personal files, send electronic mail and messages, provide word processing, personal computing facilities and maintain specialised logs and calendars.

According to BP, the Xionics system offers significant improvements over less advanced techniques giving quick access to shared pools of information.

BP had three aims in mind when it became involved with Xionics. It wanted to learn how to devise systems and programmes on microprocessors; to find out more about open systems which allow different manufacturers' equipment to be connected together and to explore how aspects of the automated office could be used within its walls.

Mr E. C. Harris, BP Oil's director of finance and plan-

ning admitted that at the time they decided to implement the electronic office there was "little choice at the time" and felt that co-operating at the development stage of the Xionics system was better than waiting for a suitable system to emerge.

In general, British Petroleum is a company which is aware of the need to investigate new technology as it arises. It considers information technology to be so important that it has set up a special department to plan and implement the company's long-term IT strategy.

Mr Harris, however, did point out that office automation is a very complex subject and "the best way ahead for BP Oil will take time to emerge."

He commented at the inauguration of the system at its computing centre in Hemel Hempstead that the experience gained with Xibus was valuable in starting the company down this difficult road.

Elaine Williams

MULLARD, the UK electronics subsidiary of Philips, and a supplier to many companies moving along the route to office automation has itself taken substantial strides to reduce the amount of paper used to run its business.

"We could not afford to run our business the old way any more. We would not be able to afford to employ all the people who would be needed to handle the paper and we would not know what is going on in the company," notes Mr Ivor Cohen, Mullard's managing director.

The problem is simply that of taking orders, informing production and despatch and so on, through to invoicing. The comparison is not, as might be thought, with some pre-computer age where armies of clerks are processing orders manually, but with a computerised system used until a few years ago.

The range of Mullard's products and customers shows why it has to rely so much on the technology which is at the heart of its own business. The company has 19,000 different products with 30,000 sub-products purchased by 3,000 customers.

When the system was first computerised, and orders were processed in batches, it still involved considerable generation and movement of paper. Mullard has now developed its on-line information processing to a level where paper barely appears. The major filing is only of the customers' original order once the information from it has been directly typed into the mainframe computer by a clerk.

The only other pieces of paper to emerge from the system are an advice note for the customer and the invoice. All internal information—such as for production delivery, account and so on—appears on video display terminals.

The most recent step has been to provide major customers with simple access to Mullard's own mainframe computer to quiz it about the level, nature and state of their own orders. More dramatically, by the end of the year they will be able to inquire about lead times, supply availability, prices, then to

order parts, from a terminal at their own premises linked to Mullard's computers via the telephone.

Customers equipped with viewdata terminals will be able to dial Mullard's new private viewdata system which will in turn, link them to its IBM mainframe after about a 20-second wait. Each customer will have a nine-digit code number as well as their own changeable private security code. The advantage of the viewdata terminal is that it is a universal system and it enables someone unfamiliar with computers to easily find the data they want by offering a simple menu of choices.

At present there are about 30 viewdata terminals on the system of which half are being used inside Mullard—for answering customer telephone inquiries—and half with customers. By the end of the year this is expected to rise to 200.

Internally Mullard has 150 terminals which give direct access to the mainframe, and another 20 terminals connected to a Philips minicomputer which is used mainly for word processing. Another minicomputer with 12 terminals is used for modelling and statistics. The minicomputers can also be used for data entry and local processing and can be linked to the mainframe computer.

About half of the staff at the Mullard House headquarters in London have terminals, and by the end of the year 60 per cent of the secretaries will be linked to the word-processing system.

Managers now study management reports on a terminal which used to run to 30 miles a month of paper notes before they were put on a real time computer system. Service engineers and salesmen are increasingly using portable terminals to operate the computer from home or hotel.

The rapid growth of information systems and the ability to communicate with them by telephone has left Mr Cohen passing a questioning eye over the substantial rates on the large central London headquarters.

Jason Crisp

The most helpful word processor is I.M.P. from OTL

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An Information Technology Company

Alan Cane reports on the seemingly bewildering variety of systems now on the market

Wide choice of electronic mail systems

SUDDENLY electronic mail is grabbing the headlines. British Leyland Systems is extolling the virtues of its Comet service. British Telecom, with unlikely sprightliness, launched its own Telecom Gold operation only last month. And a score of manufacturers and suppliers including Argeon, Case, Datapoint, Hewlett-Packard, MDS and Wang have announced proprietary systems.

Why all the excitement? After all, electronic mail in the form of the public telex system has been working effectively for many years. The answer has a

lot to do with the way in which it is expected the public will accept the electronic office. It is unlikely that any company would have the resources, financial, technical and human, to move directly to an electronic office from traditional methods of handling paperwork.

Even if such a company existed, the necessary equipment is certainly neither available in the market or can be constructed in such a form that it can all be connected easily together.

Progress is likely to be gradual and slow. First, word

processors — simple replacements for the typewriter — make their appearance, mature as products and become accepted. Other systems follow.

Electronic message and mail systems are now at the stage where they can be marketed as a distinct element of the electronic office — and the widespread acceptance of screen-based work stations and terminals has prepared the way.

Although electronic mail could be defined as any information transmitted electronically — the facsimile transmission of documents, for example —

the term is usually restricted to electronic systems which are designed to transfer short messages and electronic systems, designed as a challenge to ordinary mail.

British Telecom, for example, offers a facility on its Prestel service which enables users to send short messages to each other. On the other hand, Telecom Gold is capable of handling lengthy messages and has a host of useful facilities built on top of its basic store and forward formal.

Store and forward is the heart of message services and means that just as you do not have to be physically at home for your postman to deliver a letter, so you do not have to be physically at your desk to receive an electronic message. The message is held securely in computer storage until you are ready to receive it.

Arriving at the office in the morning you turn your terminal on and log-on to your local system — this is commonplace for many executives using computer-based accounting or predictive systems, in any case. The screen will then indicate the state of your mail box, and you can, if you wish, inspect your mail — either on the screen or using a hard copy printer. It will also organise your diary.

There are estimates that some 100,000 executives use electronic mail systems in the U.S. But as the office system consultancy Urwick Nexos put it in a review of these systems: "Who wants to replace a diary by a £1,000 terminal and have to learn to type in the process? What is wrong with a memo? About 90 per cent of letters are delivered next day and that is fast enough for most requirements. If you want to send an urgent telex you can always go to the telex room with a hand-written note."

Urwick argues the same could have been said of the telephone 100 years ago, pointing out that the chief criticisms of that system today are that telephone interruptions are disruptive and it can be frustrating to fail to get through to the person you wish to speak with.

And that, Urwick says, is where electronic mail can help: "The sender is not annoyed when he does not establish direct contact as this is not required. The system will deliver the message to its destination as and when required by the recipient."



British Telecom launched its own Telecom Gold electronic mail operation last month. Above: a control room at the Telecom Tower

relatively cheap but people are just as rare and the software to run the systems has become incomparably more expensive. Furthermore, the technology is changing rapidly. So for many customers it would make sense to go to a bureau, learn the advantages and disadvantages of electronic office systems and keep a close eye on the future.

Computer and Systems Engineering of Richmond, with offers of Informal, a system written by the U.S. consultancy Bull Branonk and Nexos, a local system recently modified for the UK market, Informal grew out of Hermes, a message program written by BEN for the U.S. Advanced Research Projects Agency (ARPA).

DISOSS, and Telemail from GTE Telnet. Some of these are complete systems, some simply software adding additional facilities to existing services.

The technicians are unanimous in their opinion that simply work value for money. According to the Urwick Nexos study, the cost justification of electronic message systems is still in doubt.

The report notes: "At a symposium on Computer Based Systems held in Ottawa on April 1981, the ability to demonstrate clearly the cost effectiveness of message systems was still open to doubt. That is not to say these systems are not cost effective, but rather that it is hard to show cost effectiveness for a list of reasons, not least because valuing managerial and professional work is very difficult."

Most efforts to quantify the value of the electronic office fall down on this point. Even the use of word processors can be difficult to justify in these simple terms.

Until there are sufficient electronic mail users to bring about the necessary economies of scale, one of the chief virtues may be that composing memoranda electronically concentrates the mind wonderfully.

Offerings

Hewlett-Packard has just announced its own electronic mail system based on its Series 3000 minicomputers, while MDS (Mohawk Data Sciences) is distributing a system called WING (Worldwide Integrated Communications) developed by Wiltek of Connecticut.

Other important offerings include Wang's Mailway, IP Sharp Associates' Mailbox, General Electric's Quickcom, IBM's

The newly-formed GEC Information Systems aims to meet needs of individual customers

GEC unveils strategy on marketing needs

THE General Electric Company, Britain's biggest electrical and electronics manufacturer, has until now conspicuously lacked any coherent strategy for realising the electronic office. This week, after almost a year's preparation, it is declaring its hand.

It has set up a new company, GEC Information Systems (GECIS), headed by Dr Nigel Horn, previously in charge of public switching. It draws together the group's activities in private branch exchanges (PBXs), telephones and terminals, computers and Reliance, its private telecommunications subsidiary which will handle sales.



Solving today's problems with a GEC Viewdata executive terminal

Dr Horn describes GECIS' approach as "evolutionary, not revolutionary." It will not promote any one technological solution as being intrinsically superior, but will aim to assemble office systems around the particular needs of each user.

"We ought to be able to stand back and give really professional advice," says Chris Ellis, technical and marketing director, who previously worked for IBM and for Nexos, the National Enterprise Board's former office systems venture.

Starting point

Not surprisingly, though, as a telecommunications manufacturer GEC sees the PBX as the starting point for most automated office systems. Its own entrant is the SL-1, a digital exchange based on technology licensed from Canada's Northern Telecom which is designed to handle more than 200 lines. GEC has sold about 100 SL-1s in Britain and hopes that existing customers will prove prime candidates for office automation.

GEC plans to offer a newly developed "black box" which will enable data terminals to be connected to the SL-1 on existing office telephone circuits. Dr Horn believes that the range of "bits" speeds available through the PBX will be more than adequate for most office users and that avoidance of expensive rewiring will be economically attractive to many customers.

GECIS aims to launch later this year two low-cost terminals, designed as desktop workstations to be used in conjunc-

tion with the PBX. Both will be able to handle voice and data simultaneously. The first will incorporate a Viewdata terminal, while the second will be able to communicate with large mainframe computers.

Dr Horn hopes that by producing in volume — he is tentatively aiming at levels of about 100,000 units a year — he will be able to price them at less than £500 each.

The second string to GECIS' bow is GEC's 4000 Series minicomputers, originally designed with an eye to defence applications. The design of the 4000 is particularly well-suited to use in communications networks — the machines are already in service in British Telecom's Prestel viewdata system.

Dr Horn plans to offer the 4000 as the hub of larger electronic office installations in which users need to communicate with remote computers. The machine is already programmed to carry out protocol conversion — that is, to "translate" between different computer languages — and to assemble information into the form in which it can be transmitted on "packet-switched" networks, which are becoming increasingly popular as a means of sending data between computers.

As an optional extra, GECIS

plans eventually to offer special programming packages which will equip the 4000 Series to handle electronic mail and to store voice messages and to carry out tasks like preparing payrolls and accounting.

The 4000 will also act as the link between terminals connected to the PBX and those attached to local area networks (LANs) — high speed office communications circuits made from coaxial cable or optical fibre. Both Dr Horn and Mr Ellis are somewhat sceptical about the claims being made for LANs which, they argue, do not yet offer the cost-benefit advantages available from PBX-based systems.

GECIS' main reservations about LANs is that, at their present state of development, they do not in practice offer substantially greater transmission capacity than PBX-based systems and that as long as there is no agreement on common technical standards for the different types of networks, customers risk locking themselves into systems which might turn out to be obsolete in future.

Nonetheless, GECIS will be prepared to supply a LAN developed by A. B. Dick, the U.S. office equipment manufacturer which GEC acquired in 1978. Dick has supplied about 50 of the networks, known as Magnaloops, to American customers, primarily as the means of connecting communicating text and graphics processing terminals.

GECIS does not at present plan to manufacture text processing equipment itself, though Dr Horn says that it will probably offer to British customers the range of Magnaloops machines developed by Dick in the U.S.

Product line

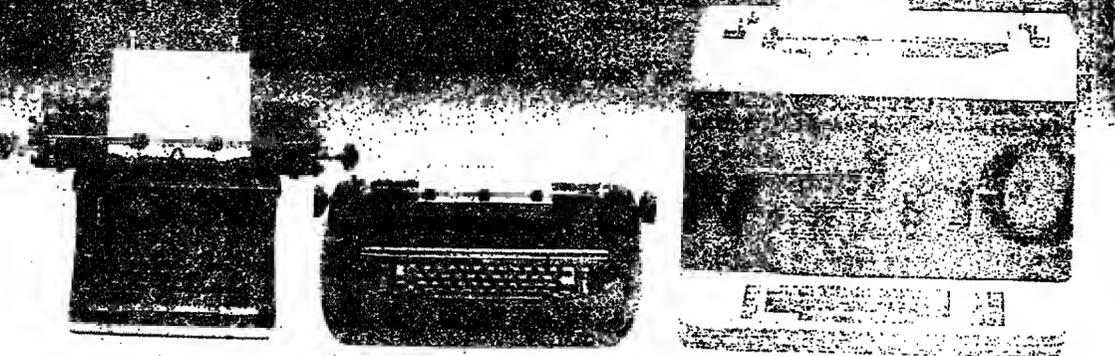
A. B. Dick's origins are firmly rooted in graphics equipment, though until recently its product line has consisted largely of copiers and duplicators based on mechanical technology. Since GEC took over, it has been attempting to rejuvenate its product strategy by developing electronic office products, which it is now selling through its extensive marketing network.

According to Dr Horn, GECIS and Dick will co-ordinate their development work, to ensure that programmes carried out on either side of the Atlantic are complementary. They also plan to collaborate directly at a new development centre established in Phoenix, Arizona, about two years ago.

GEC Computers and Dick have already joined forces to develop a powerful new minicomputer, due to be introduced later this year, and Dick is concentrating on developing techniques for document storage and handling which combine electronics and microfilm.

Dr Horn also hopes that it will be possible to sell GECIS systems in the U.S. through A. B. Dick's marketing organisation. But he says that no firm link-ups have yet been agreed, and that in the immediate future GECIS is likely to concentrate primarily on establishing itself in the UK market.

What's the greatest leap forward in typewriters since they went electric?



1942

A typical example of a machine in use during the 40s. The basic design hadn't changed much since mass production began in the early 1900s.

1962

Although based on a 19th century mechanical principle, the introduction of a spherical typing element (goldball) in the early 60s machines marked a major advance for electric typewriters.

1982

The AES Alphaplus. The high performance typewriter with a built in screen and printer. It can do more than one job at once, typing and editing a document, whilst at the same time printing another at over 300 words per minute.

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leaving the room, the phone, and you, unattended. It's the typewriter that keeps a record of everything that's typed, improving efficiency to a remarkable degree. And it's so easy to use, anyone who can type at all can type on this.

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John Lloyd examines the social implications of advanced technology in the office world

Impact of computerised communications



There are now about 75,000 word processors and electronic typewriters in use in the UK. Above: International Computers' DRS Wordskil 8801 word processing system

AS WORKERS in manufacturing industry become more and more heavily capitalised, workers in offices "stagnated." Technical change had largely passed them by: even the much feared computerisation of the fifties appeared only to increase paperwork of the conventional kind, and thus employment.

This is no longer the case. The electronic office is a shorthand phrase for the gradual replacement of paper-based communication by computerised communication. Computing power can replace, and is now replacing, an increasing number of routine clerical tasks. The first commercial computers were centralised monsters which required a new bureaucratic army to feed them: the modern derivatives are small, bringing information and intelligence to the desks of

office workers and cutting down the need for clerical staff.

Argument still rages on the long term employment effects of computerisation. But the effects depend not solely on computerisation, but on independent issues such as level of production.

The most notable breakthrough in office computerisation in recent months—and one which illustrates the case well—has been the agreement between the Government and the Civil Service unions on new technology. The deal, after two years of negotiations, clears the way for far-reaching developments, especially in the Inland Revenue and the Vehicle Licensing Centre: it will also present the Government and the unions with a sharp test of their bargaining structures and their still-shaky relationship. The agreement guarantees

that in the two years it runs the Government will not demand compulsory redundancies as a consequence of the introduction of new technology. It also lays down that unions will be fully consulted on the plans to bring in the new equipment.

Advantages

But it does specify that "a number of jobs will be lost as a result of the introduction of new technology"—though these will be dealt with by a mixture of natural wastage and redeployment. The unions were not shy, as they wished, to win what they saw as consequential benefits of new technology—a shorter working week. They have also been unable to secure a commitment to full redeployment of staff to expanded services.

Thus, for both sides, the fact

that the deal is only for two years has advantages. On the Government side, the thought must be that if natural wastage does not shrink Civil Service numbers rapidly enough, tougher demands can be made soon. For the unions, those officials reluctant to agree consoled themselves with the view that it could be improved next time.

Significantly, two unions did not agree to the deal—though their votes against in the Council of Civil Service Unions were not sufficient to sink it. The Civil Service Union, which represents the service grades, saw an eventual end to their large messenger section as paper no longer had to be carried; and the left-led Society of Civil and Public Servants thought the conditions not sufficiently tough. All unions signed with misgivings.

These misgivings arose from the brute facts of the issue. Unions seldom wish to put a stop to technical progress—though they often wish to delay it, by changing the terms under which it is introduced—yet they cannot look with equanimity on a shrinking membership, and possible eventual disappearance.

At the same time, they have legitimate fears on health and safety, and a concern that numbers be kept up by increasing services. Yet they are faced by a Government which has never hidden its desire to cut back on Civil Service staffing, and sees new technology as an ally in the task.

Such misgivings, and the same issues, confront all unions in the white collar sector; many, often in concert with manual unions, are belatedly facing up to the problems new technology brings by considering alliances

with other unions. They are also restructuring their bargaining to recognise the gradual erosion of the once-sharp differences between different types of workers and educating their activists in the effects of computerisation, and the virtues of new technology agreements.

The matter is more urgent than most unions will admit. To be faced with a large scale restructuring of work is a formidable challenge for a rather conservative union movement; to face it in a recession with a radical Conservative Government in power is daunting indeed. Beneath the official union rhetoric and the deceptive appearance of "business as usual" the restructuring of work is paralleled by the adoption, embryonic as yet, of new strategies by the unions in order to survive—and they trust—prosper once more.

VOICE SYNTHESIS SYSTEMS OF TOMORROW

Area of vast market potential

WHILE MOST office automation systems are geared towards the written word, voice is still the most prevalent form of office communication. There is a huge market for the various equipments that handle voice communications, from the telephone handset of today to the voice recognition and voice synthesis systems of tomorrow.

According to a market report published recently by the Yankee group, a Boston market analysis firm, voice manipulation equipment—private branch exchanges, telephones and related equipment—represented a \$3.8bn market in 1981 and will grow to between \$77bn and \$83bn in 1985.

Before voice signals can be manipulated by computer equipment they must be transformed for their natural analogue waveforms into digital signals. The technology required to do this is advancing very fast, driven to a large extent by the potential market for office equipment incorporating the ability of a computer to "understand" the human voice and "talk" back to the user. Among the

first examples of such systems is IBM's "talking" mag card typewriter. The same type of technology is used by Texas Instruments in its "Speak and Spell" toys for young children.

Office applications for speech synthesis include a multitude of data entry verifications and corrections. "Talking" electronic mail, for remote access to information on a computer system without a terminal, is another excellent application, particularly for travelling executives. In this case, alphanumeric messages are "transformed" into oral communications. Finally, in the near future, most office machines will "talk" to their users—to aid in training, service or maintenance, and easier input. For example, a copier might tell the operator to refill its toner, developer or paper.

According to the Yankee group report, voice synthesis devices will become pervasive in both office and home applications as the semiconductor chip makers improve the quality of synthesised speech and bring down the prices of their speech chips.

Voice recognition also has enormous potential in the office for simple data entry tasks, such as numbers, specific commands. Commercially viable voice recognition systems for continuous speech recognition are unlikely to be available until the late 1980s, but when they do arrive, such systems would make the ultimate dictation machine which could automatically produce a written copy of the speaker's words.

A large market is expected to emerge this year for digital "voice store-and-forward" (VSAF) systems in which the speaker's voice is digitised so that it can be stored on a computer disk, then reconstructed to be delivered to the recipient. Such systems will be particularly useful for remote message pick up and is an alternative to written electronic mail—overcoming the objections of executives to keyboards.

Although digital VSAF represented only a \$6m market in the U.S. last year, sales are predicted to grow to over \$350m by 1985.

Louise Kehoe

The shape of things to come

CONTINUED FROM PAGE 1

Plessey announced its version of an office network based on a telephone exchange developed by Rolm of the U.S.

The list seems endless. It is no wonder that when asked the major problems encountered in office automation, some 48 per cent of companies questioned by Urwick Nexos replied that it was ensuring compatibility of systems.

Most people agree that it will be years before standards for office automation are established. In the local area networking area, for example, there is a fierce disagreement between companies with a computing background and companies with a telecommunications background over the best way to run such a network.

The computer companies—Xerox, for example, or Logica, argue that computing power either in the terminals themselves or in a separate controller is the most cost-effective way to run the network.

The telecommunications companies—Rolm/Plessey or Northern Telecom, argue it is only logical to centre the office

around the PABX (private automatic branch exchange); every office must have one and the copper wires to everybody's desks are already in place.

There is a totally separate argument about whether a network which can carry only text and graphics or one which can carry video pictures as well is best.

Against this seething background, the position of the two giants—IBM in computers and AT and T in telecommunications—remains enigmatic.

IBM has signally failed to take a lead in the electronic office as it did in mainframe computers.

AT and T, despite its vast resources and research capabilities (including Bell Labs, probably the most prestigious electronics research establishment in the world) has yet to show its hand in office automation. Its Advanced Communications Service (ACS), a visionary concept intended to enable incompatible computers to communicate with one another, has had numerous setbacks. It may

be launched this year.

IBM's position seems to be that wiring up the office is more difficult than is commonly supposed and that it is better to proceed slowly.

Its principal offerings are a low cost stand-alone word processor, the Display writer, a small business computer and a text processing and distribution system called the 8100. It is committed to making it possible for all these devices to talk to each other. It has a computer software package elegantly called DISOSS which streamlines document handling.

10-year strategy

What an IBM electronic office might be like is indicated by a system being installed at Arthur Young McClelland, the accountants. Its intends that by 1992 some 1,000 employees, partners, managers and accountants together with administrative staff will have access electronically to all the information they need.

The system will be based around IBM's low cost small

mainframes and its 8100 Information Systems. Electronic mail based on DISOSS will be added and professionals will be able to do their own programming on special terminals.

The Arthur Young McClelland Moors plan is a 10-year strategy and therefore one of the firmest indicators of how IBM believes office automation is likely to develop.

The nagging doubt remains that IBM is just as uncertain as the rest of the industry. Late last year, the Butler Cox Foundation, established by the consultancy of the same name, visited a number of U.S. office automation suppliers to map their plans for the future.

Its most abiding impression was of the problems growth brings. Small firms often have a clear perception of their niche in the marketplace—Wang in word processing or Datapoint in distributed processing, for example—and therefore a strong sense of mission.

As they grow, they realise they cannot sustain their often

spectacular growth from such a narrow base. So they widen their horizons, but easily lose their identity in trying to become all things to all men.

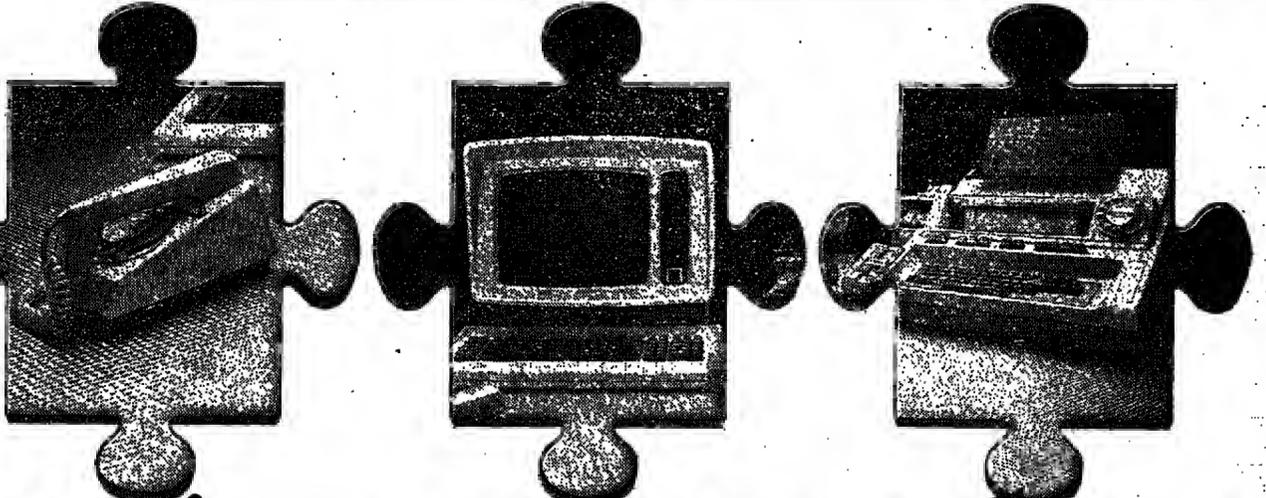
The pace of change is not slackening and several companies are finding it hard to maintain profits.

Overall, the impression remains that the electronic office is a set of products looking for a market, it is manufacturer, not user, driven.

Nevertheless, there will be cost benefits to be gained from office automation when the right equipment at the right price is available. Manufacturers will have to think harder about what people will be prepared to use. And as the ergonomist Tom Stewart has pointed out, a terminal that prints "Hello" when switched on, is fooling nobody.

Muddled thinking and jargon will not help. A company spokesman told the Butler Cox team: "The Unix operating system is a kind of a *de facto* standard now. So it's not surprising that a lot of people are using it." Quite.

Data, voice and text. In the form of data terminals, telephones and telex, these separate systems are indisputably the three prime methods of business communication. The trouble is, although each system becomes increasingly sophisticated as technology improves, there has always been one major drawback. An incapacity for each of the systems to communicate with the others. In effect, there have been barriers preventing intercommunication caused by the varying communication patterns and characteristics of each of the systems. Meaning that they've all spoken a different language. Until now. For IIT Business Systems has introduced a common denominator in the form of new technology which uses the Information Transfer Module, ITM for short.



Only we can interconnect them so they can intercommunicate.

In converting the different signalling languages of each of your communication systems, the ITM links them all up together by effectively removing the barriers which have so far kept them apart.

But to explain precisely how it all works would take a technological age.

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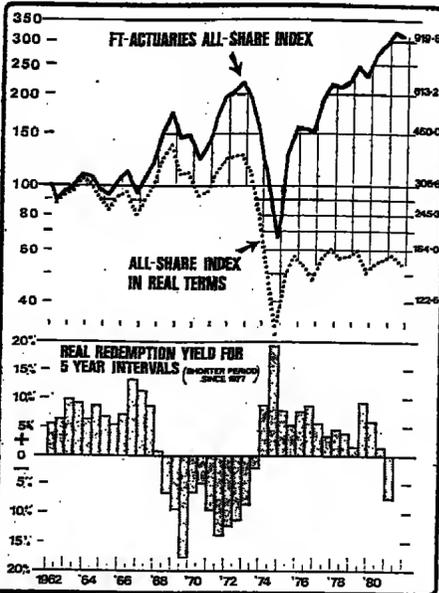


FT-ACTUARIES INDEX

Still no equal after 20 years

By R. Pain and J. Plymen

LAST SATURDAY was the 20th anniversary of the first publication of the FT-Actuaries Index...



The FT-Actuaries service is much more than a single index. It embraces the All-Share Index, with its 750 constituents...

How a comparison can be made

For example, in April 1982 the FT 30-share index stood very close to 300. Consequently a ready comparison can be made between the subsequent performance of the two indices...

The pattern of real dividends shows the impact of the high inflation rates of 1973 to 1976. Both before and after this period dividends have kept pace with the rate of inflation.

Equities bought during the years 1962-1967 and between 1974 and 1980 provided quite a high real return if sold after exactly five years or in December 1981.

Over this particular period therefore, with the performance severely affected by rapid inflation, equity purchases were best avoided. It must be admitted that 15 years ago "inflation beating" investments were hard to find.

When index linked would be best

If a similar situation were to arise in the future of course, investors would be able to switch from equities into the index-linked government stocks with an assured real return currently of between 2.5-3 per cent.

A glance at the daily group price indices shows a divergence between the long term performance of the different categories. On April 7, 1982, the highest index number in electricals at 1,264 compared with motors, the lowest at 83.

Some of the initial categories have been split into sub-sections while other groups have been put together. For example, heavy electricals and light electricals have been combined.

Lombard Last laugh for 'funny money'

By Samuel Brittan

When the decision to switch public expenditure control to a cash basis was made—and widely welcomed—a year ago this was not because anyone supposed that inflation was about to become zero or could be ignored.

It was because the previous basis for expenditure planning was based on "funny money" or "volume terms". The practical effect was to compensate spending authorities not merely for the general inflation rate but for particular increases in costs, however large.

Thus an increase in the number of teachers counted as higher public spending but a rise in pay did not. It made no difference if public authorities switched from components or materials which were rising in relative price to those which were falling or vice versa.

The cash limits system was among other things, a stop gap attempt to oluz resulting inefficiencies and lighten control. But as the limits were superimposed on an expenditure planning system designed in volume terms there was a large element of locking the stable door after the horse had bolted.

Although I was a member of the Armstrong Committee, I welcomed the switch to cash as easier to understand and having the advantage of being in the same kind of actual money as tax revenues. But the condition

Letters to the Editor

The bumpy road to Stone-Platt's receivership

From Mr J. Langham: An impartial observer would be forgiven for drawing the conclusion from the plethora of general Press comment, that the only thing that went wrong with Stone-Platt Industries was that it had hard-nosed bankers who at the first sign of real trouble withdrew their support.

businesses who so far have managed to survive, nor can the failure be blamed on the employees. By making matters worse in recent years (before Mr Pincott's time whose appointment I believe came far too late to have any chance of reversing the decline), there has been a lack of effective direction from the Board which has clearly failed to take the difficult decisions that were so obviously needed, and for that I am certainly prepared to take my share of the blame as a member of the Board at the time.

By contrast, it must be said that the Stone businesses — railway electrical equipment, pumps, propellers, and foundries — have each been relatively successful in the face of the same difficulties. Profits have, of course, slumped, and losses have been made in some of the plants, but overall they have not been disastrous. Their managements may well not have been brilliant, but there would have been no real problem for these businesses to survive either together or separately.

The Japanese way with interest rates

From Mr A. Horsnail: May I develop your important point (April 1) about interest rates in Japan where savers not borrowers enjoy the tax breaks. Here in the UK it works the other way round; industrial borrowers making profits enjoy an interest rate subsidy through offsetting corporation tax whereas private and overseas savers are penalised through withholding tax on dividends. If these concessions were removed, some believe the general levels of UK interest rates would be significantly lower.

PIA's Malaysia



The not-so-far East

If you've a long flight East, PIA are the people to make the distance seem shorter. Because we take pride in making our flights comfortable and easy—so that coming aboard seems like coming home.



Great people to fly with

Nigerian imports: From the Secretary, Crossroads: Sir—The article by your World Trade Editor (April 1) on Nigerian imports needs clarification.

banks, may or may not be accepted by the exporter at his discretion. Normally amendments to letters of credit received by exporters are welcomed since they usually extend shipment dates or remove impossible clauses but any amendment imposing inspection where previously goods were exempt may be rejected unless the exporter feels that practically the interposition of SGS will not add time and expense to the transaction.

cern themselves with shipment dates embodied in approved M forms. If the documents presented to advising/confirming banks are exactly in order then they must be paid. Obviously if UK exporters reject letter of credit amendments that request inspection and ship under letters of credit where M form shipment dates are past the paying bank has a risk in getting exchange cover from Nigeria—it would be natural if paying banks did not welcome any opportunity to transfer that risk to exporters.

The fact that U.S. Federal funds for first class borrowers persist at 14 per cent, whereas consumer prices have fallen to 7.5 per cent or even lower, has the appearance of an awful big stick in wave at world markets. Is it not the Japanese way with interest rates, which has helped to protect that economy, worthy of examination?

Companies and Markets

UK COMPANY NEWS

PENDING DIVIDENDS

Surge in publishing profit lifts Pergamon to £5.9m

A DRAMATIC improvement in profits from the publishing activities of Pergamon Press from £3.74m to £6.99m offset increased losses in other parts of the group...

charging £600,000 expenses on electronic publishing, computerised information storage and retrieval and related activities.

relief payable to BPCCC. After minority debts of £29,000 (£30,000 credits) and extraordinary losses of £468,000 (nil) the profits available for distribution amounted to £2.24m (£2.09m).

Mr Robert Maxwell, chairman of this private company, says the directors are satisfied the current year will show a considerable improvement over 1981.

A breakdown of the turnover shows publishing £31.25m (£23.9m) of which 75 per cent was exported...

Growing confidence at Fisons

THE WIDESPREAD changes that have taken place in nearly all activities of Fisons, gives it a much reduced and more competitive cost basis...

Pre-tax profits for 1981 increased from £3.8m to £9.3m, on turnover of £494.4m (£453.7m).

While not looking for any significant improvement in the economic environment, the group aims to continue to exploit its potential in 1982.

In 1982, Fisons should see the further benefits of the restructuring undertaken last year, the extraordinary costs of which have been borne in the 1980 and 1981 accounts...

Referring to the sale of its fertiliser division to Norsk Hydro, Sir George says the restructuring is regarded as a major step in the strategic development of the Fisons' business.

For 10 years he pursued the aim with apparently decreasing enthusiasm, and a year ago he sold 20 per cent of his stake to Trevor Barker, a Darlington accountant who had been involved in a northern travel business...

THE ROYAL BANK OF CANADA

U.S. \$100,000,000

Floating Rate Debentures due 1987

In accordance with the provisions of the Debentures, notice is hereby given that the rate of interest for the period from 7th April, 1982 to 7th October, 1982 has been fixed at 15.4375 per cent, per annum.

On 7th October, 1982 interest of U.S. \$392.37 per U.S. \$5,000 nominal amount of the Debentures and interest of U.S. \$392.70 per U.S. \$5,000 nominal amount of the Debentures will be due against interest coupon No. 1.

Swiss Bank Corporation International Limited

Reference Agent

Trevor Barker is new force at John Crowther

AS JOE HYMAN BOWS OUT...

BY ANTHONY MORETON, TEXTILE CORRESPONDENT

WHEN Joe Hyman covered his last connection with the John Crowther Group early in February, an era in textiles came to an end. Mr Hyman was to the sixties what Sir Freddie Laker was to the seventies...

Between 1961 and 1970, he built Viyella into a massive textile concern, absorbing others such as Van Heusen and Cyril Lord Carpets along the way.

High priority has been given to stringent cash management, which together with resources released by restructuring, has confined the net cash outflow to £0.9m, against £2.6m in 1980.

Trident Computer profit slips to £143,000

Taxable profits of Trident Computer Services for the first six months to January 31 1982 fell from £162,000 to £143,000 on a marginally higher turnover of £1.31m, compared with £1.27m.

Earnings per 10p share are given as 25p (15p) and an interim dividend of 0.5p net (nil) has been recommended.

something with it, but that I could not work with Joe Hyman for no other reason than we were two very strong characters and he would not see things my way...

Hyman had found that, beset by the worst recession the industry had known, he had been unable to do for Crowther what he had done for Viyella, despite valuing all dividends and not taking a salary.

When Hyman arrived, the company was operating with 1,000 old-fashioned looms; these have been reduced to 25 of the latest Sulzers from Switzerland.

Citicorp Overseas Finance Corporation N.V.

Notices and Agreements dated of April 3, 1982 between Citicorp Overseas Finance Corporation N.V. and Citibank, N.A., notice is hereby given that the Rate of Interest has been fixed at 15 1/2 per cent...

The Industrial Bank of Japan Finance Company N.V.

In accordance with the terms and conditions of the Notes and the provisions of the Reference Agency Agreement between The Industrial Bank of Japan Finance Company N.V. and Citibank, N.A., notice is hereby given that the Rate of Interest has been fixed at 15 1/2 per cent...

The Industrial Bank of Japan Finance Company N.V.

In accordance with the terms and conditions of the Notes and the provisions of the Reference Agency Agreement between The Industrial Bank of Japan Finance Company N.V. and Citibank, N.A., notice is hereby given that the Rate of Interest has been fixed at 15 1/2 per cent...

The Industrial Bank of Japan, Limited

London Floating Rate Certificates of Deposit \$10,000,000 due October 15th 1984

FINANCE FOR INDUSTRY TERM DEPOSITS.

Deposits of £1,000-£50,000 accepted for fixed terms of 3-10 years. Interest paid gross, half-yearly. Rates for deposits received not later than 18/4/82

For the convenience of readers the dates when some of the more important company dividend statements may be expected in the next few weeks are given in the following table.

Table with columns: Company Name, Dividend Type, Date, Amount, and Remarks. Includes companies like AE, Alkermid, Asoc. Paper, Bank of Scotland, etc.

RECENT ISSUES EQUITIES

Table listing recent equity issues with columns: Issue Price, Amount, Date, and Remarks. Includes AIM Group 10p, Amstarham, etc.

FIXED INTEREST STOCKS

Table listing fixed interest stocks with columns: Issue Price, Maturity, Rate, and Remarks. Includes Barclays 15 1/2, etc.

"RIGHTS" OFFERS

Table listing rights offers with columns: Issue Price, Amount, Date, and Remarks. Includes Sph/Anabacher (H) 5p, etc.

Public Works Loan Board rates

Table showing Public Works Loan Board rates with columns: Years, Quota loans repaid, and Effective April 10.

M. J. H. Nightingale & Co. Limited

Table listing company shares with columns: 000's Capitalisation, Company Name, Price, Change, and Yield.

Large advertisement for BTR (British Textile Resources) featuring the text 'The EXTRA contribution.' and 'Last year was very tough. Just look how many of the world's important economies were in recession.'

Advertisement for BTR plc, Silvertown House, Vincent Square London SW1P 2PL. Includes contact information and company details.

Handwritten signature or stamp at the bottom of the page.

Companies and Markets

INTERNATIONAL CAPITAL MARKETS

CREDITS

Argentina fails to meet deadline

THE FIRST impact of Argentina's decision to block payments to British banks emerged at the end of last week when its central bank told Chase Manhattan's London subsidiary that it would not meet a payment deadline on a \$50m revolving credit arranged last autumn for the oil drilling company Cia de Perforaciones Rio Colorado.

INTERNATIONAL BONDS

IBM syndrome strikes again

THE IBM syndrome struck the Eurodollar market again last week, and a number of U.S. corporations found themselves able to borrow money from Swiss investors with bonds yielding less than U.S. Treasury paper.

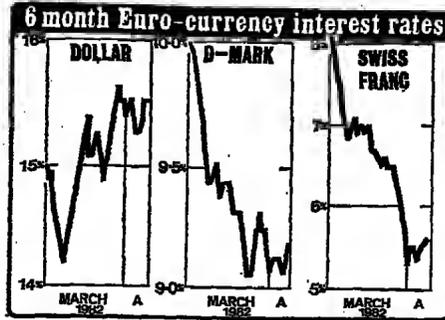
The syndrome in question is the phenomenon whereby famous U.S. companies team up with aggressive European new issue managers and play upon the sometimes insatiable appetite of Swiss investors for easily recognisable U.S. corporate names.

While the secondary market was sluggish last week the new issues sector was buzzing. A total of \$535m of new fixed-interest Eurodollar bonds were launched in the four days before the Easter weekend.

Among the U.S. borrowers cashing in on funds which were clearly cheaper than in the States were Campbell Soup and Getty Oil. American Express, although not such a premier name, also joined in the fun and borrowed cheaply in Europe.

How does the IBM syndrome work in action? A Campbell Soup issue is brought to market with an aggressive 14 per cent coupon. The issue is only \$50m so it is not going to be a large amount to move anyway.

The name-conscious Swiss investors are out in force. Yet the more sophisticated institutional investors elsewhere are not going to prefer such a paper, even from top quality U.S. corporations, if they can get a



higher yield from U.S. Treasury bonds. But the Swiss are buying. On Thursday, the U.S. 14 1/2 per cent 1989 Treasury bonds were yielding 14.79 per cent on an annual basis.

In the secondary market the Eurodollar sector closed last week on a decidedly sluggish note. The bond markets on both sides of the Atlantic are once again talking about the expected surge in U.S. M-1 money supply figures.

Perhaps there is a fair degree of sense in the argument against the publication of weekly U.S. money supply figures: the statistics are difficult to rely upon, they have a sometimes disproportionate impact on financial markets, and they only increase the U.S. bond market's volatility.

Volatility is the word for the sterling bond sector these days. As the Falkland Islands crisis becomes more serious, the previously buoyant bulldog bond market has lost its confidence.

Bulldog bonds — domestic sterling issues by foreign borrowers — follow the fortunes of UK gilts. The gilt market lost three points last week and the bulldog sector lost between two and three points. Whereas the underlying tone had been healthy before the crisis and interest rates were beaded downward, uncertainty now pervades this market.

In the Japanese capital markets the World Bank is launching its 15th bond issue, a ¥30bn 12-year samurai bond at

8 per cent. The samurai bond market — the domestic yen bond sector for foreign borrowers — saw prices rise by about 1 point last week, roughly the same amount as in the Euro-yen bond market.

The Japanese government bond market had a less happy week as the Bank of Japan tried to nudge interest rates higher to protect the yen.

The Continental Eurobond markets, the Euro D-mark sector closed the week 1 point higher, while the Swiss franc foreign bond market was 1 point stronger by Thursday.

The Inter-American Development bank brought out a DM 150m 10-year issue at 9 per cent, priced at 99 1/2 to yield 9.08 per cent. The paper was changing hands on Thursday at about its issue price, a good sign.

The West German Capital Market Sub-committee meets this week to set the next calendar for the foreign bond sector. 9.08 per cent. The paper was about DM 1bn a month of new issues.

In Switzerland the falling inflation rate is encouraging the bond market, and a number of recent issues are trading above par.

Alan Friedman

U.S. BONDS

Thin outlook as prices drift down

WITH LUCK, trading on Wall Street will not be blotted out by another blizzard this week. But in other respects, the credit markets are expected to be much the same — thin and hesitant.

Bond prices drifted a little lower last week, and short-term interest rates were mixed. Most striking was the decline of the Fed Funds rates from the unusually high levels it reached during the end-of-quarter trading at the turn of the month.

Scotism was still dominated by worries about the money supply, which analysts had warned would rise sharply as people liquidated investments in advance of the April 15 tax payment deadline.

The comparatively low increase announced by the Federal Reserve Board last Friday (it was up \$900m) showed that analysts had got the direction right, if not the size of the change.

Unless the hedge is truly massive, however, the Fed has the option to sit tight as it did during the blip in the first quarter of this year. Despite last Friday's rise, M1 is still only slightly above target, and its general movement since January has been downward.

The Fed also revealed in its February meeting that it might broaden or raise M-1's target range to allow for the fact that people prefer to keep their money in savings accounts

and money market funds these days (where it gets included in the money supply) rather than in investments (where it does not).

This "liquidity preference" has already been blamed by top Fed officials for much of the volatility in the money supply in recent months. The Fed is also considering this week whether to change the current weekly money supply announcement and do away with what has come to be known as the Friday afternoon "crap shoot."

Wall Street's other big worry, the Federal budget deficit, brought some good and bad news.

Reports from Washington suggested that Congress and the White House may have moved closer to a compromise on the Budget in secret talks.

On the other hand, the White House raised its forecast for this year's deficit by \$2bn to \$100.5bn and next year's by \$10bn.

The trouble is that even the increased figures fall tens of billions of dollars short of deficit estimates that are doing the rounds on Wall Street and are being discounted in the credit markets.

Table with columns: U.S. INTEREST RATES (%), Week to Week, April 8, April 2. Rows include Fed funds wky. av., 3-month Treas. bills, 3-month GO, 30-year Treas. bonds, AAA 1/2, AA Industrial, Source: Salomon Brothers (est. matrs) in the week to March 21 M1 rose \$500 to \$446 bn.

David Lascelles

CURRENT INTERNATIONAL BOND ISSUES

Table with columns: Borrowers, Amount m., Maturity, Av. life years, Coupon %, Price, Lead manager, Offer yield %. Rows include U.S. DOLLARS, CANADIAN DOLLARS, D-MARKS, SWISS FRANCS, YEN.

OCKS

S

ard rail

Limit

This announcement appears as a matter of record only

FUERZAS ELECTRICAS DE CATALUNA, S.A. (FECSA)

(فكسه) شركة فورزاس الكاتلونية، ش.م. (CATALONIA — SPAIN) كاتلونية — اسبانيا

US\$ 40,000,000

MEDIUM TERM LOAN

قروض متوسط الأجل

Managed by

بإدارة كل من

THE NATIONAL BANK OF KUWAIT S.A.K. ARAB BANKING CORPORATION (ABC)

البنك الوطني الكويتي (ش.م.ك.) المؤسسة العربية المصرفية

BANQUE DE L'INDOCHINE ET DE SUEZ بنك الاندوشين والسويس

Co-managed by

EUROPEAN ARAB BANK (MIDDLE EAST) E.C. LYBIAN ARAB FOREIGN BANK

Provided by

- THE NATIONAL BANK OF KUWAIT S.A.K. ARAB BANKING CORPORATION (ABC) BANQUE DE L'INDOCHINE ET DE SUEZ EUROPEAN ARAB BANK (MIDDLE EAST) E.C. LYBIAN ARAB FOREIGN BANK ABU DHABI INVESTMENT COMPANY FRAB BANK INTERNATIONAL KUWAIT FOREIGN TRADING CONTRACTING AND INVESTMENT CO. (S.A.K.) UBAF ARAB AMERICAN BANK ALAHLI BANK OF KUWAIT K.S.K. ARAB TRUST COMPANY K.S.K. INDUSTRIAL BANK OF KUWAIT K.S.K. UBAN-ARAB JAPANESE FINANCE LIMITED

المندراء المساعون

البنك العربي — الأوربي (الشرق الأوسط) E.C. المصرف العربي — الليبي للتجارة الخارجية

الممولون

البنك الوطني الكويتي ش.م.ك. المؤسسة العربية المصرفية بنك الاندوشين والسويس البنك العربي — الأوربي (الشرق الأوسط) E.C. المصرف العربي الليبي للتجارة الخارجية شركة أبو ظبي للاستثمار البنك العربي الفرنسي للاستثمارات الدولية الشركة الكويتية للتجارة والمقاولات (ش.م.ك.)

يوفيا — المصرف العربي — الأميركي البنك الأهلي الكويتي شركة الائتمان العربية بنك الكويت الصناعي يوفيا — الشركة العالمية العربية اليابانية المحدودة

Agent الوكيل ARAB BANKING CORP. (ABC)

المؤسسة العربية المصرفية



U.S. \$50,000,000

Fluor Finance N.V.

13 3/4% Notes due September 30, 1984

with Warrants to purchase U.S. \$150,000,000

Zero Coupon Debentures due March 31, 1990

The Notes and Debentures will be unconditionally guaranteed by

Fluor Corporation

MORGAN GUARANTY LTD

- AMRO INTERNATIONAL LIMITED CREDIT SUISSE FIRST BOSTON LIMITED DEUTSCHE BANK AKTIENGESELLSCHAFT KUWAIT INVESTMENT COMPANY (S.A.K.) SWISS BANK CORPORATION INTERNATIONAL UNION BANK OF SWITZERLAND (SECURITIES) S.G. WARBURG & Co. LTD. YAMAICHI INTERNATIONAL (EUROPE) LIMITED

April 6, 1982 These securities are not registered under the Securities Act of 1933 and may not be offered or sold in, or to nationals or residents of, the United States. This announcement appears as a matter of record only.

Mitsui directors to retire in summer

BY CHARLES SMITH, FAR EAST EDITOR, IN TOKYO

MITSUI AND COMPANY, the Japanese trading company involved in the loss-making Bandar Khomeini petrochemical project in Iran, announced yesterday that five executives of director level and above, as well as the company's standing auditor, will retire in June. The list includes the chairman, Mr Yoshio Ikeda, but not Mitsui's president Mr Ioshikuni Yaburo. Mr Yaburo will stay on as chief executive to handle the problems of extricating the company from Bandar Khomeini.

Hongkong & Shanghai banks in joint venture

BY WILLIAM HALL, BANKING CORRESPONDENT

WARDLEY and Marine Midland Bank, both part of the Hongkong and Shanghai Banking Corporation, are to establish a London investment management operation to service the rapidly growing foreign investment needs of U.S. pension funds. The operation is understood to be the first joint venture between Wardley, a Hong Kong merchant bank, and Marine Midland, a large U.S. commercial bank, in which Hongkong and Shanghai holds a majority stake.

Modest increase by BHF Bank

BERLINER HANDELS und Frankfurt Bank (BHF Bank) announced a rise in 1981 net earnings to DM 26.3m (\$10.86m) from DM 25.3m in 1980, our financial staff writes. Presenting the bank's results, Herr Christian Schroeder-Hohenwirth, co-chairman, said that better operating earnings with lower refinancing costs were given priority over net assets, which rose only 1.1 per cent to DM 9.09bn after a 9 per cent growth in 1980.

FRENCH BONDS

Foreign investors steer clear of Paris issues

FOR THOSE with a fondness for such details, today is something of a landmark in the development of French capital markets. Holders of shares in the newly nationalised banks and industrial groups are required to exchange them for state issued compensation bonds, and the new bonds become tradeable on the secondary market. The swap thus brings down the curtain on the final act of France's nationalisation drama. The equity market, deprived of some of its most prestigious names, is left in the shadows, and the bond market becomes the major source of long-term capital.

pressure from the authorities to give first preference to subscribing to a government backed loan to plug the deficit in the unemployment benefit fund. In this relatively unfavourable climate, the government has held back from launching the new state loan that had been expected. The Ministry of Finance, it had been thought, had been hoping to market this with a 15 per cent coupon as compared with the 16.20 per cent on the FFR 8bn state loan raised in January. But with the bank of France's day-to-day money market rate still held at 17 per cent in defiance of the franc this remains unrealistic at the moment.

increasingly lean on bank insurance companies, and other institutional investors, even which nationalisation has given it an increasingly strong influence to take up issues at lower rates than would normally be acceptable. The risk of this is that the French market would become increasingly dominated and controlled from international funds. Meanwhile for French investors, the "compensation" bonds of which the capital is repayable over 15 years and which on issue carry a coupon of 15.6 per cent are attractive. The current average yield of state bonds is 16.10 per cent. For foreigners, the first occupation will continue to be the size and timing of the next French devaluation.

David Houston

New chief for Midland Bank Canada

Mr Jack E. B. Nederpelt has been elected president, chief executive officer and member of the board of directors of MIDLAND BANK CANADA, Toronto, the wholly-owned subsidiary of Midland Bank. He succeeds Mr Dennis G. Sherwood, who is retiring. Mr Richard D. Alman has been elected a vice-president of the WESTERN UNION TELEGRAPH COMPANY, principal subsidiary of Western Union Corporation. He will be primarily responsible for the company's priority mail services, which include commercial applications of Mailgram message service, Western Union Computer Letter Service, and the operations of Western Union Electronic Mail, Incorporated.

INTERNATIONAL APPOINTMENTS

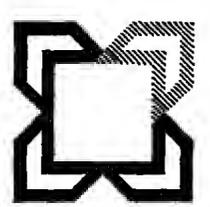
research. Dr Edward A. Szklidz has become assistant director of research. Mr Gerald G. Probst, former chairman of Sperry Univac, has been elected chief executive officer of SPERRY CORP. Mr Probst, who is president of the chairman of the board as well as chief executive officer of Sperry. Mr WARBURG PARIBAS BECKER & BECKER, New York, has appointed Mr Michael J. Rolland as a managing director in New York. Mr Rolland's responsibilities include mergers and acquisitions and general corporate finance for UK companies. Mr Ron Geddes has been appointed managing director of PROTECH INTERNATIONAL (SINGAPORE). He succeeds Mr Richard Crockett who is returning to the UK. Mr G. J. Mader has been appointed to the board of BOW VALLEY INDUSTRIES, Calgary, as president and chief operating officer. He recently resigned as chairman of Hudson's Bay Oil Gas Company, E. K. Seaman, chairman and chief executive officer of Bow Valley will relinquish the post of chief executive officer following the annual meeting in May. Mr Seaman, who founded the Bow Valley group, will remain as chairman. Mr Andrew G. Genor has been appointed vice president, finance and administration, at HONEYWELL EUROPE SA, Brussels. He was treasurer of Honeywell Inc. Mr Nad Fowler has been named president of the Ideco division of DRESSER INDUSTRIES, INC., succeeding Mr Nick Klust, who left Ideco to accept a promotion with Dresser's compressor group. Mr Fowler was vice-president of product management for the Ideco division in Beaumont, Texas. Mr FRIENDLY FROST INC.

INTERNATIONAL APPOINTMENTS

Mr Daniel Schuler has resigned as president and as a member of the board for personal reasons. Mr Abe Chapnik has become interim president of the company until it completes the sale of its WFFN stock to H. E. Radio of New York, after which it is expected that the Swanton Corp. will be taken control of by Friendly Frost. In addition to the presidency, Mr Schuler will continue as treasurer. Mr William James, new executive vice president, mining, for Noranda Mines, will become president and chief operating officer of FALCONBRIDGE NICKEL MINES on April 20 when Mr H. T. (Pete) Berry steps down from these two positions. Mr Berry, who is expected to retire at the end of this year, remains as chairman and chief executive officer. Mr James, one of Canada's top mining executives, is the first of the Noranda insiders group to leave since control of that company was acquired by BRASCADE RESOURCES. NATOMAS COMPANY has appointed Mr William Jaeger vice president-administration and control for Natomas Coal Company. H. J. HEINZ COMPANY, Pittsburgh, has expanded its board of directors to 15 members with the addition of Mr Richard B. Patton, who also was named a senior vice president of the company. Mr Patton has served the last two years as an area director of Heinz with responsibility for the Heinz Canada, Hurlingham, Westchester, subsidiaries while working on special corporate projects.

Mr Lara Westfall, SEAROA INSURANCE CO. deputy chief executive of the European zone and manager for the international marine and aviation division, from July 1 will become deputy zone executive of the Asian Pacific Zone. He will be based in Hong Kong and be responsible for the company's operations in the Hong Kong and Japan regions. Mr Westfall, formerly vice president of the company, succeeded Mr Westfall as division manager. Mr Andrew W. Donnelly, vice president and managing director of European operations based in Brussels, of the RALSTON PURINA CO., will be leaving to head the international operations of the ALBERTO CULVER CO. in Chicago as its vice president international from May 1. Mr Glenn E. Peniston has been elected a vice president of GOULD INC., in addition to his position as chairman of the board and chief executive officer of its subsidiary American Microsystems, Inc. (AMI). Mr David T. Johnston, senior vice president and director of E. F. Hutton & Co., Inc., has been re-elected chairman of the board of governors of COMMODITY EXCHANGE, INC. (COMEX). Mr Irving Redel was re-elected treasurer of the Exchange. TEXAGULF INC. has elected Mr Albin Chalandon and Mr Andre Tarrallo to its board. Mr Chalandon is chairman and chief executive officer of SOFPA Nationale, EIR Aquitaine (SNEA), while Mr Tarrallo is chairman and chief executive officer of SOFPA Nationale, EIR Aquitaine (SNEA), while Mr Tarrallo is chairman and chief executive officer of SOFPA Nationale, EIR Aquitaine (SNEA), while Mr Tarrallo is chairman and chief executive officer of SOFPA Nationale, EIR Aquitaine (SNEA).

New issue. These securities having been sold, this announcement appears as a matter of record only. April 1982.



Development Bank of the Philippines

U.S. \$30,000,000 Guaranteed Floating Rate Notes due 1990

The Republic of the Philippines

- Lloyds Bank International Limited
Fuji International Finance Limited
Allied Banking Corporation
Ayala International Finance Limited
Credit Lyonnais Hong Kong (Finance) Limited
London & Continental Bankers Limited
ITCB International Limited
Philippine Commercial and Industrial Bank
PNB International Finance Limited
Standard Chartered Merchant Bank Limited
Tokai Kyowa Morgan Grenfell Limited

FT INTERNATIONAL BOND SERVICE

Table with columns for U.S. DOLLAR, YEN STRAIGHTS, OTHER STRAIGHTS, EUROBOOND TURNOVER, and FLOATING RATE NOTES. Includes various bond listings with columns for Issued, Bid, Offer, and Yield.

Arabic text at the bottom of the page.

UK COMPANY NEWS

Chas. Hill improves in second half

Chas. Hill improved in the second half of the year, with a 10% increase in profits...

GA again looks to investments

General Accident Insurance Co. is looking to invest in property and infrastructure...

Slight fall at Wemyss Investment

Wemyss Investment Trust reported a slight decline in its share price...

Profit setback at Rand London

Rand London's profits were hit by a sharp decline in its coal operations...

BOARD MEETINGS

Table listing board meetings for various companies including Anglo-Siam, Anglo-Siam, Anglo-Siam, etc.

Royal London ups bonuses

Royal London Mutual Insurance Society has increased its bonus scale for 1982...

WELBECK INV.

Corsec Holdings, a subsidiary of Welbeck Investment, has acquired 85% of Thomas Ryan...

ASSOC. NEWSPAPERS

Associated Newspapers Group has increased its dividend for 1982...

Redemption Notice

City of Oslo (Norway)

Notice is hereby given that the City of Oslo has issued bonds for redemption...

Table of bond numbers for the City of Oslo, including columns for bond numbers and amounts.

On May 1, 1982 there will become due and payable upon each bond selected for redemption...

QUEENS MOAT

Shareholders of Queens Moat Hotels, the hotel group, approved the acquisition of 26 hotels from Grand Metropolitan...

BASE LENDING RATES

Table of base lending rates for various banks including A.B.N. Bank, Allied Irish Bank, American Express, etc.

LOCAL AUTHORITY BOND TABLE

Table of local authority bond rates, including columns for Authority, Annual Interest, and Life.

Advertisement for Transco International N.V. offering U.S. \$50,000,000 in 15% Guaranteed Notes Due 1987.

Advertisement for Transco Companies, Inc. offering U.S. \$50,000,000 in 15% Guaranteed Notes Due 1987.

Advertisement for The 500 Largest Commercial Banks in the World, featuring a memorandum to the banks.

General Investors

After-tax revenue of General Investors and Trustees Investment Trust increased from £1.1m to £1.23m...

NOTICE TO HOLDERS OF TOSHIBA CORPORATION

Reference is hereby made to the Notice of Application and Termination of Conversion Rights...

ENERGY RESOURCES & SERVICES INCORPORATED

Net Asset Value 31st March 1982 \$6.78 per share (unaudited)

STOCKHOLDERS FAR EAST INVESTMENTS INC.

Net Asset Value 31st March 1982 \$1.73 per share (unaudited)

THE TRING HALL USM INDEX

118.3 (+0.9) close of business 8/4/82

LADBROKE INDEX

Close 360.565 (+1)

APPOINTMENTS INSURANCE

Extra MDs at Laing

Mr David Bottom and Mr Oliver Whitehead have been appointed additional joint managing directors of JOHN LAING CONSTRUCTION...

Mr A. E. Hepper has been appointed a director of THE CARDINAL INVESTMENT TRUST.

Mr Douglas Muirhead has been appointed chairman of LESLIE & GODWIN (SCOTLAND). He was previously UK chairman of P.A. Management Consultants.

Mr George Veitch has been assumed a partner of BALLIE GIFFORD & CO., investment trust.

Mr Bruce Leeming has been appointed deputy managing director of London metal commodity brokers, RUDOLF WOLFF.

Sir Neil Shields, who was recently appointed a member of the COMMISSION FOR THE NEW TOWNS, has taken over as chairman from the beginning of this month.

M. R. S. Cooper has been appointed managing director of JOHNSON MATTHEY CHEMICALS. He succeeds Mr P. D. Barker who, while remaining a director of Johnson Matthey Chemicals, has relinquished his post as managing director to concentrate on his work as divisional director of the chemicals and refining division.

Mr Rex Chester, chairman of Donald Macpherson Group, has been elected president of the PAINTMAKERS ASSOCIATION OF GREAT BRITAIN; he succeeds Mr Derrick Johnson of ICI Paints division.

Sir Ian Trethowan is to succeed Lord Plimmer as chairman of the HORSE RACE BETTING LEVY BOARD when he retires on September 30.

Mr Rex Chester, chairman of Donald Macpherson Group, has been elected president of the PAINTMAKERS ASSOCIATION OF GREAT BRITAIN; he succeeds Mr Derrick Johnson of ICI Paints division.

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The fat that grows out of peace of mind

BY RICHARD LAMBERT IN NEW YORK

IF YOU TOOK all the people employed in the U.S. insurance industry and laid them from end to end, they would stretch from the southern tip of Manhattan by way of the George Washington Bridge and the New Jersey Turnpike to a joint just short of Salt Lake City. It seems like a lot too many.

The banking industry, which handles three times as much money and many times more transactions, makes do with about 250,000 fewer employees than the 1.5m in insurance. The advent of the microchip, which you might have thought would have brought enormous savings in paperwork—has not yet even checked the growth in the work force.

This theme of a witty and thought-provoking new book by Andrew Tobias is that the U.S. insurance industry is overweight and inefficient. This argument is built around the idea that in some ways, insurance is analogous to banking. Banks and insurance companies are both financial intermediaries. But you are allowed to withdraw from a bank 100 per cent of what you deposit, the amount you get back from an insurance company depends on your bad luck.

The insured as a group will wind up getting back much of what it put in, but just how much each individual can draw out depends on whether he or she has to make a claim.

But what kind of a bank is it that gives you back 65 cents in the dollar? That's how the overall repayment comes out on motor insurance. In other classes of insurance, the proportion held back for expenses, overheads and profit is even greater.

In flight insurance (which Tobias evidently thinks is utter trickery), the payback is 10 cents in the dollar. Some will get more, most will get nothing, but on average the company retains 90 cents of every dollar on this class of business, plus interest earned on premiums.

Put another way, U.S. motor insurance premiums amount to some \$40bn a year, and investment income on this money might raise the gross income to roughly \$44bn. Of that sum, only \$20-\$25bn come back to the public.

Not that the money returns actively. A recent survey of motor accidents suggested that a person who lost up to the equivalent of \$2,500 received payments of more than \$2 for every \$1 of economic loss—before paying lawyers' fees. But those who suffered greater economic losses—presumably

those in greatest need—received less than \$1 back for each \$1 of economic loss.

Tobias has some unkind words about U.S. insurance managers, especially in the mutuals, who are not constrained by shareholders, and who do not live as austere as their counterparts in Scotland. "This is not to say that mutual management is incompetent or dishonest," says Tobias dryly. "There is a noble calling, not unlike religious or government service. It just pays better."

This is entertaining stuff—yet the idea of such large-scale inefficiency is quite hard to swallow, especially in a consumer-oriented society like that of the U.S. The costs of entry to the industry are not high, and the returns can be very attractive. Why hasn't competition sweated the fat out of the industry?

Tobias has a number of explanations. The industry has a long history of cartels. The five insurance business, for instance, grew up as a massive exercise in price-fixing. Insurance prices, especially for life policies, are very difficult to evaluate and compare. Federal regulations largely exempt the insurance sector, and state regulators are keen to keep even inefficient companies in business. Most policyholders are stranded.

Most important may be the fact that aggressive marketing plays an important part in personal sector business, and customers are often more concerned about peace of mind than about immediate dollar values ("Well, ma'am, if you can't afford five dollars a month, you certainly can't afford cancer.")

Yet times are changing. The traditional life insurance classes have been knocked in the last year or two by the impact of high inflation and aggressive non-traditional competition. High interest rates have changed established yardsticks in the property casualty sector almost out of recognition, and a marked deceleration in economic growth has brought a new wave of international competition.

But if the book's points are less sharp than they might have been 10 years ago, its ultimate chapter, "How (God Would) Restructure the Insurance Industry," is still required reading for insurance executives and regulators everywhere.

The Invisible Bankers by Andrew Tobias, published in the U.S. by Linden Press/Simon and Schuster, \$15.50.

WORLD VALUE OF THE POUND

The table below gives the latest available rate of exchange for the pound against various currencies on April 8, 1982. In some cases rates are nominal. Market rates are the average of buying and selling rates except where they are shown to be otherwise. In some cases market rates have been calculated from those of foreign currencies to which they are tied. Schedule 1: Variations; (T) tourist rates; (S) basic rate; (B) buying rate; (P) based on U.S. dollar parities and going sterling/dollar rates; (S) number of the starting area other than U.K.; (C) convertible rate; (N) non-commercial rate; (O) official rate; (R) selling rate; (K) bankers' rates; (M) commercial.

Table with 6 columns: PLACE AND LOCAL UNIT, VALUE OF £ STERLING, PLACE AND LOCAL UNIT, VALUE OF £ STERLING, PLACE AND LOCAL UNIT, VALUE OF £ STERLING. Lists various countries and their exchange rates with the pound.

*Part of the French community in Africa formerly French West Africa or French Equatorial Africa. (1) Rubles per pound. (2) General rates of oil and gas exports. (3) U.S. is the transfer market (controlled). (4) New one official rate. (5) Unfixed rate. (6) Not on official rate. (7) Unfixed rate. (8) Based on gross rate against Russian roubles. (9) Partially exchange rate for essential imports. (10) Exports, non-essential imports and transfer. (11) New one rate. (12) Essential goods. (13) The Australian \$ rate for April 5 should have been 1.5500.



Advertisement for THE QUEEN'S AWARDS FOR EXPORT AND TECHNOLOGY. Includes text about the awards, contact information for R. W. Roe at Financial Times, and the logo for the Queen's Awards.

BUILDING AND CIVIL ENGINEERING

Construction outlook not so black

FOLLOWING the disastrous performance of 1981... construction output this year will stabilise and lead to modest gains in 1983 and 1984...

brighter outlook yet expects advances to be made in both public and private housing activity... By the end of last month there had been no significant real increases in output...

anything like this size. The more modest rise of 10 per cent in cash spent on trunk roads... The outcome is a declaration that private housing once again appears to be staging a revival...

Householders are reluctant to commit themselves after last year's false dawn... The 1982 recovery will have greater staying power than last year and forecast a rise in private housing starts...

Improvements boost worth £500m

ENLIGHTENED self-interest—and a refreshing honesty about admitting it—was the theme behind last week's launch of Campaign '82...

could, by next year, account for over 40 per cent of total construction output... The FMB, with some 20,000 member firms, has the men in the recent budget...

out of its total projected lending of £500m to £600m. The B and B will, however, apply a "slight loading" to interest rates on money lent for home improvements...



Engineering contractors to the oil, gas, chemical, process and power generation industries. William Press Group, Tel 01-333 6544.

AROUND THE INDUSTRY

QATAR'S minister of industry and agriculture has just opened the Hempel Group's fifth factory in the Arabian Gulf at Doha...

THE CEMENT and Concrete Association's next Advanced Concrete Technology course will be held on October 11-23 this year...

ANGLIA LEAD Roofing is extending the advantages of lead roofs with the publication of a ten-page brochure...

THE BUILDING RESEARCH Establishment has asked us to make it clear that the remarks reported on last week's building page and attributed to Dr Stephen Wozniak...

What's new in building

Weatherproofing and thermal insulation are the prime advantages offered with a new roofing system called Rubbertherm...



A roll of Rubbertherm being applied to a vapour retarder

Another benefit of the new adhesive is that it forms a satisfactory bond in the damp... A security lighting package which automatically switches on lights when prowlers or would-be intruders approach...

Ward Brothers has launched a profiled metal flue sheet for industrial buildings... Economic, self-adhesive cloth tape for masking out cat-calls, grids and manholes...

HIGGS AND HILL BUILDING will extend the medical school incorporating hospital laboratories at St George's Hospital in Tooting under a newly won £3.7m contract...

THE CO-OPERATIVE INSURANCE SOCIETY is to develop a triangular area in Mayfair, just off New Bond Street...

Development will contain covered shopping parades over whose roofs will be an outlook from three storeys of offices...

MORE THAN 27m worth of new work has been secured in this first quarter by G. E. WALLIS & SONS...

UK CONTRACTS

ments in Gwent and mid-Wales worth £1.5m... a £250,000 new primary school contract at Pontypool...

At the Eastern Docks at Dover, Wallis will carry out refurbishment of the booking hall facilities for a further £1m...

Two contracts, together worth over £500,000, are for the restoration of the Chamber ceiling of the House of Lords...

FIVE CONTRACTS (total value £5m plus) to build houses, bungalows, flats and flatlets in Liverpool, St Helens and Manchester...

UK CONTRACTS

Worth £1.2m, 71 flats, houses and bungalows will be constructed at Pigot Street, St Helens for the St Helens Metropolitan Borough Council...

Another contract, worth about £1.1m, is for a road shed under one kilometre in length, linking Warrington Wood Way and St George's Road at Donnington Wood...

Work has just started on extending storage facilities for Texaco at Kingsbury Oil Terminal, near Tamworth (value £704,000).

BOVIS CONSTRUCTION have been awarded a further £4.7m refurbishment contract for Shell UK (Administration Services).

Stage three at Shell Centre is in the downstream building which has been divided into two phases. The first phase comprises the conversion of an existing coffee lounge area into nine individual private dining rooms...

Another contract, worth about £1.1m, is for a road shed under one kilometre in length, linking Warrington Wood Way and St George's Road at Donnington Wood...

COMPANY NOTICES

COMPAGNIE FINANCIERE DE PARIS ET DES PAYS-BAS. NOTICE TO SHAREHOLDERS AND TO HOLDERS OF THE CONVERTIBLE BONDS ISSUED IN 1976 WITH A RISING INTEREST RATE.

EMPRESAS LAS INDUSTRIAS S.A. DE C.V. FLOATING RATE NOTES DUE 1985. Notice to holders of floating rate notes.

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INTERNATIONAL & BRITISH EDITORIAL & ADVERTISEMENT OFFICES. London: 100 Broad Street, London EC4P 3DF. Tel: 01-333 3000.

The First Canadian Bank Bank of Montreal. Notice to Holders of FLOATING RATE DEBENTURES, SERIES 6, DUE 1991.

NOTICE TO HOLDERS OF EUROPEAN DEPOSITARY RECEIPTS (EDRs) IN ASAHI GLASS CO., LTD. Further to our notice of December 22, 1981, EDR holders are informed that Asahi Glass Co., Ltd. has paid a dividend of 100 yen per share...

NOVA SCOTIA POWER CORPORATION. 9 1/2% Sinking Fund Debentures 1989. The Bank of Nova Scotia Trust Company Channel Islands Limited as Fiscal Agent announces that the entire redemption fund of US\$2,100,000 due 15th May, 1982, has been met by purchases in the market.

Ok Tedi Mining Limited. Bank of America. Investment Banking Group. The Broken Hill Proprietary Co. Ltd. Standard Oil Company (Indiana) Metallgesellschaft AG. Degussa AG. Deutsche Gesellschaft fuer Wirtschaftliche Zusammenarbeit (Entwicklungsgesellschaft) mbH. Ok Tedi Mining Limited which is owned by the above consortium members and The Independent State of Papua New Guinea. Financing to be provided through: Export Finance and Insurance Corporation, Kreditanstalt fuer Wiederaufbau, Export Development Corporation, Export Credits Guarantee Department, Oesterreichische Kontrollbank AG, Overseas Private Investment Corporation.

WORLD STOCK MARKETS

NEW YORK

Table listing various stocks such as ACI, AM, ARA, and their prices.

Stock

Table listing stock prices for various companies like Columbia Gas, Combined Ind, and others.

Stock

Table listing stock prices for companies like Gulf Oil, Mobil, and others.

Stock

Table listing stock prices for companies like BHP, Anglo, and others.

Stock

Table listing stock prices for companies like Shell, BP, and others.

Stock

Table listing stock prices for companies like British Petroleum, Anglo, and others.

Stock

Table listing stock prices for companies like Anglo, Anglo, and others.

Stock

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Stock

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Dow lower after featureless morning

PRICES continued lower in featureless trading as investors adopted a wait-and-see attitude amid economic and international uncertainty. The Dow Jones Industrial Average was 0.76 lower at 822.18 on volume of 23.5m shares at mid-session. Declines led advances by six to five. The NYSE All Common Index was 19 cents off at 866.70.

Jersey may change law on loan security

A NEW LAW has been proposed in Jersey to solve problems over the use of stocks and shares. Life assurance policies and similar moveable assets as collateral for a loan—a situation that has hampered banking business on the island.

Most issues showed only marginal price changes and trading volume focused on those stocks in merger or other special situations. Schlitz was the volume leader and rose 1/4 to 51 1/2. Stroh Brewery has offered \$18 a share for 57 per cent of Schlitz's stock, and at last Thursday, 54 per cent of the shares were tendered in response to the bid.

One of his reports dealt with mortgages of personal property, although his proposals were considerably more comprehensive than those embodied in the present Bill. The main change is that Mr Morgan's draft law covered all moveable property, while the Bill's final form is confined to intangible assets.

Singapore

Prices finished higher on late buying. Boustead added 16 cents at \$52.40. Geylang Industries added 23 cents at \$5.50, and Malay Bank 25 cents at \$6.50.

Wildlife charity moves

THE DUKE OF EDINBURGH, president of the World Wildlife Fund—UK, will open the fund's headquarters in Godalming, Surrey, on June 8.

Canada

Share prices were sharply higher at mid-session, paced by a strong gain in Oil and Gas stocks. The Federal Government might join the Alberta Government in introducing tax concessions to help the troubled oil industry.

Belgium (continued)

Table listing stock prices for Belgium companies like Petrofina, Sotoban, and others.

France

Table listing stock prices for France companies like Elf, Elf, and others.

Holland

Table listing stock prices for Holland companies like AFM, AFM, and others.

Germany

Table listing stock prices for Germany companies like Allianz, Allianz, and others.

Italy

Table listing stock prices for Italy companies like Ansaldo, Ansaldo, and others.

Japan

Table listing stock prices for Japan companies like Daiwa, Daiwa, and others.

Norway

Table listing stock prices for Norway companies like Bergens, Bergens, and others.

Sweden

Table listing stock prices for Sweden companies like Alfa, Alfa, and others.

Switzerland

Table listing stock prices for Switzerland companies like ABB, ABB, and others.

Australia

Table listing stock prices for Australia companies like Anglo, Anglo, and others.

Singapore

Table listing stock prices for Singapore companies like Boustead, Boustead, and others.

INDICES

Table showing various stock indices like Dow Jones, Nikkei, and others.

STANDARD AND POORS

Table showing Standard and Poors indices for various regions.

NEW YORK ACTIVE STOCKS

Table listing active stock prices in New York.

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CURRENCIES, MONEY and GOLD

MONEY MARKETS

Counting on the fleet

BY COLIN MILLHAM

INTEREST RATES reacted predictably to the Falkland Islands crisis last week, creating an unusual problem for the London money market...

previous day, but the market took very little notice because of its concern with the Falkland Islands.

money is drifting around trying to find a home, and dragging down the key seven-day interbank rate, while fixed period rates rise on the bank of a weakening pound.

Monday and Thursday. One large factor was an increase of £22m in the note circulation before the Easter holiday...

WEEKLY CHANGE IN WORLD INTEREST RATES

Table showing weekly change in world interest rates for London, New York, Tokyo, and other major cities, including rates for various terms like 1 month, 3 months, and 6 months.

BANK OF ENGLAND TREASURY BILL TENDER

Table showing Bank of England Treasury Bill tender results for April 8 and April 2, including applications, total, and minimum levels.

FT LONDON INTERBANK FIXING

Table showing interbank fixing rates for 3 months and 6 months U.S. dollars, with bid and offer rates.

LONDON MONEY RATES

Table showing London money rates for various terms including overnight, 1 month, 3 months, and 6 months.

The fixing rates (April 8) are the arithmetic means, rounded to the nearest one-hundredth of a percent...

EURO-CURRENCY INTEREST RATES (Market closing rates)

Table showing Euro-currency interest rates for various currencies including Sterling, U.S. Dollar, Canadian Dollar, Dutch Guilder, Swiss Franc, French Franc, Italian Lira, Belgian Franc, Yen, and Danish Krone.

CURRENCIES AND GOLD

Sterling nervous

Sterling fell to a 41-year low against the dollar last Tuesday, and then fluctuated nervously as the foreign exchange market tried to decide whether a peaceful settlement or a naval battle was the most likely outcome of the Falklands dispute.

THE DOLLAR SPOT AND FORWARD

Table showing dollar spot and forward rates for various currencies including UK, Ireland, Canada, Netherlands, Belgium, France, Portugal, Spain, Italy, Norway, Sweden, Japan, and Switzerland.

THE POUND SPOT AND FORWARD

Table showing pound spot and forward rates for various currencies including UK, Ireland, Canada, Netherlands, Belgium, France, Portugal, Spain, Italy, Norway, Sweden, Japan, and Switzerland.

FORWARD RATES AGAINST STERLING

Table showing forward rates against sterling for various currencies including Dollar, D-Mark, French Franc, Swiss Franc, and Japanese Yen.

EMS EUROPEAN CURRENCY UNIT RATES

Table showing EMS European Currency Unit rates for various currencies including Belgium, Danish, Dutch, French, German, Italian, and Spanish.

GOLD

Table showing gold prices in various currencies including U.S. Dollar, British Pound, and Japanese Yen.

OTHER CURRENCIES

Table showing exchange rates for various other currencies including Argentina, Australia, Brazil, Canada, Denmark, Finland, France, Germany, Hong Kong, India, Italy, Japan, Korea, Luxembourg, Malaysia, New Zealand, Norway, Singapore, South Africa, and Switzerland.

EXCHANGE CROSS RATES

Table showing exchange cross rates for various currencies including Pound Sterling, U.S. Dollar, Deutschmark, Japanese Yen, French Franc, Swiss Franc, Dutch Guilder, Italian Lira, and Canadian Dollar.

FT UNIT TRUST INFORMATION SERVICE

Authorised Trusts section containing numerous sub-sections for different trust managers such as Abbey Unit Trst. Mgrs., Allied Members Ltd., Alton Harvey & Ross Unit Trst. Mgrs., and many others, listing various investment funds and their performance.

BOLD
That's BTR

FT SHARE INFORMATION SERVICE

FOOD, GROCERIES—Cont.

Stock	Price	Chg	Vol	High	Low
Am. Food	12.50	0.10	100	12.60	12.40
Am. Grocers	15.20	0.20	150	15.40	15.00
Am. Super	18.80	0.30	200	19.10	18.50
Am. Wholesale	22.10	0.40	250	22.50	21.70
Am. Food (100)	12.50	0.10	100	12.60	12.40
Am. Grocers (100)	15.20	0.20	150	15.40	15.00
Am. Super (100)	18.80	0.30	200	19.10	18.50
Am. Wholesale (100)	22.10	0.40	250	22.50	21.70

HOTELS AND CATERERS

Stock	Price	Chg	Vol	High	Low
Am. Hotels	10.50	0.10	100	10.60	10.40
Am. Caterers	12.80	0.20	150	13.00	12.60
Am. Hotels (100)	10.50	0.10	100	10.60	10.40
Am. Caterers (100)	12.80	0.20	150	13.00	12.60

INDUSTRIALS (Misc.)

Stock	Price	Chg	Vol	High	Low
Am. Ind. 1	15.20	0.20	150	15.40	15.00
Am. Ind. 2	18.80	0.30	200	19.10	18.50
Am. Ind. 3	22.10	0.40	250	22.50	21.70
Am. Ind. 4	25.50	0.50	300	26.00	25.00
Am. Ind. 5	28.90	0.60	350	29.40	28.40

ENGINEERING—Continued

Stock	Price	Chg	Vol	High	Low
Am. Eng. 1	15.20	0.20	150	15.40	15.00
Am. Eng. 2	18.80	0.30	200	19.10	18.50
Am. Eng. 3	22.10	0.40	250	22.50	21.70
Am. Eng. 4	25.50	0.50	300	26.00	25.00
Am. Eng. 5	28.90	0.60	350	29.40	28.40

DRAPERY AND STORES

Stock	Price	Chg	Vol	High	Low
Am. Drapery	10.50	0.10	100	10.60	10.40
Am. Stores	12.80	0.20	150	13.00	12.60
Am. Drapery (100)	10.50	0.10	100	10.60	10.40
Am. Stores (100)	12.80	0.20	150	13.00	12.60

CHEMICALS, PLASTICS—Cont.

Stock	Price	Chg	Vol	High	Low
Am. Chem. 1	15.20	0.20	150	15.40	15.00
Am. Chem. 2	18.80	0.30	200	19.10	18.50
Am. Chem. 3	22.10	0.40	250	22.50	21.70
Am. Chem. 4	25.50	0.50	300	26.00	25.00
Am. Chem. 5	28.90	0.60	350	29.40	28.40

BEERS, WINES AND SPIRITS

Stock	Price	Chg	Vol	High	Low
Am. Beers	10.50	0.10	100	10.60	10.40
Am. Wines	12.80	0.20	150	13.00	12.60
Am. Spirits	15.20	0.30	200	15.50	14.90
Am. Beers (100)	10.50	0.10	100	10.60	10.40
Am. Wines (100)	12.80	0.20	150	13.00	12.60
Am. Spirits (100)	15.20	0.30	200	15.50	14.90

ELECTRICALS

Stock	Price	Chg	Vol	High	Low
Am. Elec. 1	15.20	0.20	150	15.40	15.00
Am. Elec. 2	18.80	0.30	200	19.10	18.50
Am. Elec. 3	22.10	0.40	250	22.50	21.70
Am. Elec. 4	25.50	0.50	300	26.00	25.00
Am. Elec. 5	28.90	0.60	350	29.40	28.40

BANKS & H.P.—Cont.

Stock	Price	Chg	Vol	High	Low
Am. Bank 1	15.20	0.20	150	15.40	15.00
Am. Bank 2	18.80	0.30	200	19.10	18.50
Am. Bank 3	22.10	0.40	250	22.50	21.70
Am. Bank 4	25.50	0.50	300	26.00	25.00
Am. Bank 5	28.90	0.60	350	29.40	28.40

BUILDING INDUSTRY, TIMBER AND ROADS

Stock	Price	Chg	Vol	High	Low
Am. Build. 1	15.20	0.20	150	15.40	15.00
Am. Build. 2	18.80	0.30	200	19.10	18.50
Am. Build. 3	22.10	0.40	250	22.50	21.70
Am. Build. 4	25.50	0.50	300	26.00	25.00
Am. Build. 5	28.90	0.60	350	29.40	28.40

AMERICANS

Stock	Price	Chg	Vol	High	Low
Am. Stock 1	15.20	0.20	150	15.40	15.00
Am. Stock 2	18.80	0.30	200	19.10	18.50
Am. Stock 3	22.10	0.40	250	22.50	21.70
Am. Stock 4	25.50	0.50	300	26.00	25.00
Am. Stock 5	28.90	0.60	350	29.40	28.40

LOANS—Continued

Stock	Price	Chg	Vol	High	Low
Am. Loan 1	15.20	0.20	150	15.40	15.00
Am. Loan 2	18.80	0.30	200	19.10	18.50
Am. Loan 3	22.10	0.40	250	22.50	21.70
Am. Loan 4	25.50	0.50	300	26.00	25.00
Am. Loan 5	28.90	0.60	350	29.40	28.40

FOREIGN BONDS & RAILS

Stock	Price	Chg	Vol	High	Low
Am. Bond 1	15.20	0.20	150	15.40	15.00
Am. Bond 2	18.80	0.30	200	19.10	18.50
Am. Bond 3	22.10	0.40	250	22.50	21.70
Am. Bond 4	25.50	0.50	300	26.00	25.00
Am. Bond 5	28.90	0.60	350	29.40	28.40

BRITISH FUNDS

Stock	Price	Chg	Vol	High	Low
Am. Fund 1	15.20	0.20	150	15.40	15.00
Am. Fund 2	18.80	0.30	200	19.10	18.50
Am. Fund 3	22.10	0.40	250	22.50	21.70
Am. Fund 4	25.50	0.50	300	26.00	25.00
Am. Fund 5	28.90	0.60	350	29.40	28.40

INDEX-Linked & Variable Rate

Stock	Price	Chg	Vol	High	Low
Am. Index 1	15.20	0.20	150	15.40	15.00
Am. Index 2	18.80	0.30	200	19.10	18.50
Am. Index 3	22.10	0.40	250	22.50	21.70
Am. Index 4	25.50	0.50	300	26.00	25.00
Am. Index 5	28.90	0.60	350	29.40	28.40

COMMONWEALTH AND AFRICAN LOANS

Stock	Price	Chg	Vol	High	Low
Am. Loan 1	15.20	0.20	150	15.40	15.00
Am. Loan 2	18.80	0.30	200	19.10	18.50
Am. Loan 3	22.10	0.40	250	22.50	21.70
Am. Loan 4	25.50	0.50	300	26.00	25.00
Am. Loan 5	28.90	0.60	350	29.40	28.40

LOANS Public Board and Ind.

Stock	Price	Chg	Vol	High	Low
Am. Loan 1	15.20	0.20	150	15.40	15.00
Am. Loan 2	18.80	0.30	200	19.10	18.50
Am. Loan 3	22.10	0.40	250	22.50	21.70
Am. Loan 4	25.50	0.50	300	26.00	25.00
Am. Loan 5	28.90	0.60	350	29.40	28.40

TRAILBLAZERS

company to start-up production in Cwyd. Guided and supported by Cwyd's unbeatable industrial development agencies, this venture has got off to a flying start.

For new and growing enterprisers like Hoya, through to major established manufacturers like BICC, Cwyd works, day in, day out.

In the last 4 years, over 200 companies have chosen Cwyd. We know why. For example, a highly skilled and trainable workforce, with an outstanding industrial relations record are as important as the new motorway and dual carriageway link to the national motorway network—15m consumers are just 2 lorry hours away.

Above all, financial incentives provided to the highest available anywhere in mainland G.B. are the key component in the Cwyd package.

In helping you to promote positive attitudes, without red tape.

Ophthalmic lens manufacturer, Hoya Corporation, is the first Japanese.

All the facts are in our colour brochure. For your copy, contact Wayne S. Morgan, County Industrial Officer, Cwyd County Council, Sme Hall, Mold, Cwyd, North Wales, Tel: Mold (0352) 2121. Telex: 61454.

Cwyd

offers you great potential in North East Wales

FINANCIAL

Stock	Price	Chg	Vol	High	Low
Am. Fin 1	15.20	0.20	150	15.40	15.00
Am. Fin 2	18.80	0.30	200	19.10	18.50
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AMERICAN

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INDUSTRIALS—Continued

Table of industrial stocks including companies like Anglo-Siam Corp, Anglo-Siam Petroleum, Anglo-Siam Rubber, etc.

LEISURE—Continued

Table of leisure and entertainment stocks including companies like British Picture Palace, British Picture Palace, etc.

PROPERTY—Continued

Table of property and real estate stocks including companies like British Picture Palace, British Picture Palace, etc.

INVESTMENT TRUSTS—Cont.

Table of investment trusts including companies like Anglo-Siam Petroleum, Anglo-Siam Rubber, etc.

OIL AND GAS—Continued

Table of oil and gas stocks including companies like Anglo-Siam Petroleum, Anglo-Siam Rubber, etc.

MINES—Continued

Table of mining stocks including companies like Anglo-Siam Petroleum, Anglo-Siam Rubber, etc.

NOMURA The Nomura Securities Co., Ltd. logo and contact information.

MOTORS, AIRCRAFT TRADES

Table of motor and aircraft trade stocks including companies like Anglo-Siam Petroleum, Anglo-Siam Rubber, etc.

SHIPPING

Table of shipping stocks including companies like Anglo-Siam Petroleum, Anglo-Siam Rubber, etc.

SHOES AND LEATHERS

Table of shoe and leather stocks including companies like Anglo-Siam Petroleum, Anglo-Siam Rubber, etc.

SOUTH AFRICANS

Table of South African stocks including companies like Anglo-Siam Petroleum, Anglo-Siam Rubber, etc.

TEXILES

Table of textile stocks including companies like Anglo-Siam Petroleum, Anglo-Siam Rubber, etc.

OVERSEAS TRADERS

Table of overseas trader stocks including companies like Anglo-Siam Petroleum, Anglo-Siam Rubber, etc.

NEWSPAPERS, PUBLISHERS

Table of newspaper and publisher stocks including companies like Anglo-Siam Petroleum, Anglo-Siam Rubber, etc.

PAPER, PRINTING ADVERTISING

Table of paper, printing, and advertising stocks including companies like Anglo-Siam Petroleum, Anglo-Siam Rubber, etc.

TOBACCO

Table of tobacco stocks including companies like Anglo-Siam Petroleum, Anglo-Siam Rubber, etc.

TRUSTS, FINANCE, LAND

Table of trusts, finance, and land stocks including companies like Anglo-Siam Petroleum, Anglo-Siam Rubber, etc.

RUBBERS AND SISALS

Table of rubber and sisal stocks including companies like Anglo-Siam Petroleum, Anglo-Siam Rubber, etc.

TEAS

Table of tea stocks including companies like Anglo-Siam Petroleum, Anglo-Siam Rubber, etc.

PROPERTY

Table of property stocks including companies like Anglo-Siam Petroleum, Anglo-Siam Rubber, etc.

INSURANCE

Table of insurance stocks including companies like Anglo-Siam Petroleum, Anglo-Siam Rubber, etc.

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PROPERTY

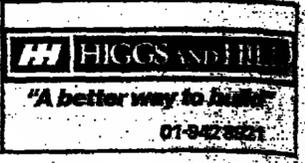
Table of property stocks including companies like Anglo-Siam Petroleum, Anglo-Siam Rubber, etc.

REGIONAL MARKETS

Table of regional market data including various international indices and exchange rates.

OPTIONS

Table of options data including 3-month call rates and other derivatives.



Syrian pipeline closure a serious blow to Iraq

Saudis may reduce oil output

BY ROGER MATTHEWS AND SUE CAMERON

SAUDI ARABIA is considering another 300,000 barrels a day cut in its oil output...

United Arab Emirates and Qatar. The military setback it recently received during a major Iranian offensive...

EEC to aid steel and shipbuilding regions

By Anthony Moreton, Regional Affairs Correspondent

THE EUROPEAN Commission is about to announce a package of aid for steel and shipbuilding areas in Britain...

THE LEX COLUMN A slow boat to Suez



Anyone looking through 25-year-old copies of the Financial Times in search of the City's response to the British Government's last major military adventure...

been assured (journalists being as glib as they are) that the authorities did not need to intervene...

Compromise hope on U.S. budget

By Reginald Dale, U.S. Editor, in Washington

MR ROBERT DOLE, Republican chairman of the Senate Finance Committee, said yesterday he hoped President Ronald Reagan would this week indicate whether he could accept a broad compromise on his controversial 1983 budget proposals.

Shop stewards reject BL collective bargaining plan

BY ARTHUR SMITH, MIDLAND CORRESPONDENT

BL CARS' much-heralded package of industrial relations reforms, has run into new trouble. Shop stewards from the company's two biggest unions—the transport workers and engineers—have failed to support the proposed agreement...

There are fears, particularly at the Longbridge plant, Birmingham, that the company will turn increasingly to contract labour to cut costs. Though the draft proposals remain silent on the issue, the unions made it clear they would continue checking union cards of contract labour regardless of legislation.

Firestone

might be vulnerable to a takeover. As well as bringing in badly needed cash, selling Hertz would also take a substantial amount of associated borrowing out of RCA's balance sheet.

Falklands

Continued from Page 1 diplomatic isolation from all except a handful of other Latin American countries, Argentina was yesterday preparing to invoke an Inter-American Treaty of Reciprocal Assistance which would oblige its members to come to its aid to confront Britain's fleet.

Britain's successful mobilisation of Government opinion among European neighbours.

Sr Francisco Gerra, the head of the small Christian Democrat party, is representing the Multi-Partidario—the political opposition front on a trip to Spain, Italy and the Vatican; while a former Ambassador to Rome, Sr Rafael Martinez Raymond has also been despatched to Italy.

Former Turkish Prime Minister rearrested

BY METIN MUNIR IN ANKARA

MR BULENT ECEVIT, the former Turkish Prime Minister, was rearrested in Ankara yesterday only hours after a military court, hearing charges that he had given an interview to a Norwegian newspaper in defiance of Government orders, had ordered his release from detention.

TURKEY'S military authorities yesterday accused the Ankara correspondent of the Financial Times and the British Broadcasting Corporation, Mr Metin Munir, of writing false and unfounded stories. He was threatened with deportation.

Mr Ecevit's detention comes in the wake of a stern warning from General Kenan Evren, the head of state and chief of staff, to former political leaders, whom he toppled 19 months ago, that he would not hesitate to take the "severest measures" against former political leaders unless they stopped all political activity.

Weather

UK TODAY DRY WITH bright periods. Occasional rain in some areas. Generally cold.

WORLDWIDE

Table with columns for location, weather, and temperature. Locations include London, Paris, Rome, etc.

HOW READY IS YOUR READY-MADE FACTORY?

Advertisement for Northampton Ready-made and expanding, featuring a factory image and contact information for Donald McLean.